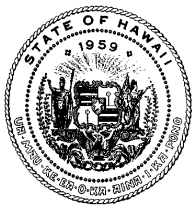

Phase I Environmental Site Assessment at East Kapolei Brownfields Site

Kapolei, Oahu, Hawaii

Prepared for:

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ASO Log No. 02-131

September 2004

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LIST OF ACRONYMS

AMEC	AMEC Earth and Environmental, Inc.
ASTM	American Society for Testing and Materials
ASTDR	Agency for Toxic Substances and Disease Registry
BCY	Bank Cubic Yards
bgs	Below Ground Surface
CDD	Chlorinated Dibenzo-p-dioxins
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CONSENT	Database Containing Superfund Consent Decrees
CORRACTS	Corrective Actions
CY	Cubic Yards
DHHL	Department of Hawaiian Homelands
DLNR	Department of Land and Natural Resources
DOD	Federal Lands - administered by the Department of Defense
EECA	Engineering Evaluation and Cost Analysis
ESA	Environmental Site Assessment
EDR	Environmental Data Resources, Inc.
ERNS	Emergency Response Notification System
FIFRA	Federal Insecticide, Fungicide, & Rodenticide Act

FINDS	Facility Index System / Facility Identification Initiative Program Summary Report
FPHA	United States of America Federal Public Housing Authority
FONSI	Finding of No Significant Impact
HDOH	State of Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response
HMIRS	Hazardous Materials Information Reporting System
LCY	Loose Cubic Yards
LQG	Large Quantity Generators
LUST	Leaking Underground Storage Tank
Mg/kg	milligrams per kilogram
MINES	Mines Master Index Files
MLTS	Material Licensing Tracking System
MSL	Mean Sea Level
NPL	National Priorities List
OSC	Oahu Sugar Company
OSWER	Office of Solid Waste and Emergency Response
PADS	PCB Activity Database System
Ppb	parts per billion
PCB	Polychlorinated Biphenyl
PRG	Preliminary Remediation Goal
RAATS	RCRA Administrative Action Tracking System
RCRA	Resource Conservation and Recovery Act

RCRIS	Resource Conservation and Recovery Information System
ROD	Records of Decision
SARA	Superfund Amendments and Reauthorization Act
SHWS	State Hazardous Waste Sites List
SPILLS	DOH Hazard Evaluation and Emergency Response (HEER) Office State Spills List
SQG	Small Quantity Generators
SSTS	Section Seven Tracking Systems
SWF/LF	Facilities permitted as solid waste landfills, incinerators, or transfer stations in the State of Hawaii
TEQ	Toxicity Equivalent
TMK	Tax Map Key
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substance Control Act
TSD	Treatment Storage and Disposal
UIC	Underground Injection Control Line
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank

SECTION 1
INTRODUCTION

This report, prepared by AMEC Earth and Environmental, Inc. (AMEC), presents the results of an enhanced Phase I Environmental Site Assessment (ESA) at East Kapolei (hereafter referred to as the "Site"). The site is located in Kapolei on the Island of Oahu, Hawaii and encompasses five parcels of property within approximately a ½-mile radius of each other. The Site includes the following parcels of property designated by the City and County of Honolulu Tax Map Keys (TMK) 1-9-1-017-071, 1-9-1-017-088, 1-9-1-017-086, 1-9-1-016-008, and 1-9-018-005. This document was prepared under the State of Hawaii Department of Health (HDOH) non-emergency response contract (ASO Log No. 02-132).

The purpose of the Environmental Site Assessment is to permit the user of the document to satisfy one of the requirements to qualify for *innocent landowner defense* status in reference to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Under CERCLA, owners and operators of real estate where there is hazardous substance contamination may be held strictly liable for the costs of cleaning up contamination found on their property. No evidence linking the owner/operator with the placement of the hazardous substances on the property is required. Congress, in response to pressure from business and academic groups, established the "innocent landowner defense" in the 1986 amendments to CERCLA known as the Superfund Amendments and Reauthorization Act (SARA). To establish innocent landowner status, the landowner "must have undertaken, at the time of acquisition, all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial and customary practice in an effort to minimize liability."

The American Society for Testing and Materials (ASTM) E1527-00 defines the standard of "good commercial and customary practice" for conducting an environmental site assessment of a parcel of property as the identification of *recognized environmental conditions*. The term *"recognized environmental conditions",* is defined by the ASTM E1527-00 standard, as the presence or likely

presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies. Conditions determined to be *de minimis* are not *recognized environmental conditions.*

In an effort to clarify what constitutes "all appropriate inquiry," the ASTM has developed a standard that provides specific definition of the steps one should take when conducting a "due diligence" Phase I environmental site assessment for commercial real estate. The site assessment documented herein complies with the current ASTM E1527-00.

1.1 PURPOSE

The purpose of this investigation was to identify and evaluate *recognized environmental conditions* that need to be addressed prior to redevelopment for residential or commercial use. This was accomplished by conducting a site reconnaissance and a review of existing information pertaining to the Site and evaluating if further investigation is warranted prior to future redevelopment.

1.2 SCOPE OF SERVICES

The ESA scope of work involved the following tasks:

1. Historical Records Review

    - Review of available archive maps and historical land use maps for the Site;
    - Review of aerial photos

- Property transfer records at the Bureau of Conveyances, located at the State of Hawaii, Department of Land and Natural Resources
- Review of previous environmental investigations
- Review of available documents regarding past and present Site development;
- Review of the State of Hawaii and U.S. Environmental Protection Agency (USEPA) databases of hazardous waste generators, violations, underground storage tank facilities, landfills, and sites currently under investigation within a one mile radius of the study area;

2. Site Reconnaissance of the Property
   - Visual observations of current site conditions;
3. Summary of Findings
   - Description and evaluation of recognized environmental conditions;
4. Recommendations to address recognized environmental conditions
   - Specific recommendations for further investigation, if warranted;
   - Rough order of magnitude cost estimates for recommendations to address recognized environmental conditions;

1.3 SITE DESCRIPTION

The following subsection describes the site location, general characteristics of the Site, aquifer classification, geology and current land use.

1.3.1 Site Location and Legal Description

The Site is located on the southwest side of the island of Oahu, in Kapolei, Hawaii (Figure 1-1). According to the City and County of Honolulu Department of Planning and Permitting, The East Kapolei Site consists of five irregularly

shaped parcels of land situated within ½-mile of each other in the same geographical vicinity (Figure 1-2).

TMK 1-9-1-017-071

TMK number 1-9-1-017-071 is adjacent to and located west of TMK 1-9-017-088. According to the City and County of Honolulu Real Property Assessment and Treasury Division, this parcel is listed at 204.254 acres, and is owned by the State of Hawaii, Department of Land and Natural Resources (DLNR). This parcel is bound to the south by the Ewa Villages golf course, to the west by the proposed North/South Road, to the north and east by agricultural lands.

TMK 1-9-1-017-088

According to the City and County of Honolulu Real Property Assessment and Treasury Division, this parcel is listed at 200 acres, and is owned by the State of Hawaii. The property is leased by the State of Hawaii, DLNR Land Division, to Aloun Farms, with a revocable permit. The revocable permit number is listed as 7152 R010000790 + 2026432. This parcel is adjacent to TMK 1-9-017-071. This parcel is bound to the south by the Ewa Villages golf course, to the west, north, and east by agricultural lands.

TMK 1-9-1-017-086

According to the City and County of Honolulu Real Property Assessment and Treasury Division, this parcel is listed at 40.619 acres, and is owned by the State of Hawaii. This parcel is approximately 600-700 feet north of TMK 1-9-1-017-088. This parcel is bound to the west by the proposed North/South Road, to the north by Farrington Highway, to the east and south by agricultural lands.

TMK 1-9-1-018-005

According to the City and County of Honolulu Real Property Assessment and Treasury Division, this parcel is listed at 65.999 acres, and is owned by the State of Hawaii. The property is leased by the State of Hawaii, DLNR Land Division, to Larry Jefts. This parcel is located directly north of TMK 1-9-017-086. This parcel

is bound to the south by Farrington Highway, to the north by H-1 Freeway, to the west and east by agricultural lands.

TMK 1-9-1-016-008

According to the City and County of Honolulu Real Property Assessment and Treasury Division, this parcel is listed at 31.915 acres, and is owned by the State of Hawaii. The property is leased by the State of Hawaii, DLNR Land Division, to Larry Jefts. This parcel is located approximately 1,200 feet west of TMK 1-9-018-005. This parcel is bound to the south by Farrington Highway, to the north by H-1 Freeway, to the west and east by agricultural lands.

TMK parcel maps, and legal information of the property owners and lessees are located in Appendix A.

1.3.2 General Characteristics

According to the U.S. Geological Survey 7.5 Minute Series Topographic map, dated 1983, for the Ewa Quadrangle, the Site is located in Honouliuli, in an area where elevation ranges from 70 to 180 feet above mean sea level. Despite the relatively large range in elevation on the property, its slope ranges between 1-3% from the northern most point of the parcel toward the south. The surrounding area west, north and east of the site is in agricultural use. The Ewa Villages Golf Course is located along the south boundary of the Site, with the area immediately south of the golf course in residential use.

There are no paved interior roads within the parcel properties. Unpaved or dirt roads within the Site are fairly well defined, and not encumbered by weeds or vegetation. Access to the interior portions of the Site via unpaved roads is secured with metal gates and locks. Access to the interior portion of the site is minimized by bermed soil approximately 5-6 feet in height along the perimeter.

Irrigation channels and flumes are observed passing through portions of the Site. Although these channels and flumes are present, they are no longer used to transport water for irrigation. Water used for irrigation is transported through a

network of underground piping connected to a water pumping station located along Farrington Highway.

1.3.3 Aquifer Classification

According to aquifer classification records (Mink and Lau 1990), the Site is located above the Pearl Harbor Aquifer Sector, in the Waipahu Aquifer System. The aquifer at the Site is classified as an unconfined, basal, and flank aquifer (Mink and Lau 1990). The status code is listed as a currently used fresh drinking water source that is irreplaceable and has a high vulnerability to contamination (Mink and Lau 1990). The Site receives an average annual rainfall ranging from 18-30 inches per year, with much of the rain falling between the months of November to April. (USDA 1972).

Additionally, the Site is situated up-gradient of the Hawaii State Underground Injection Control (UIC) Line of this area of Oahu. The UIC line segregates aquifers currently used, or potentially used, as drinking water sources. Typically, the aquifers down-gradient of the UIC line are considered non-potable, and the aquifers up-gradient of the UIC line are considered potential sources of drinking water. Since the Site is located up-gradient of the UIC line, the water below the Site is characterized as a potential drinking water source.

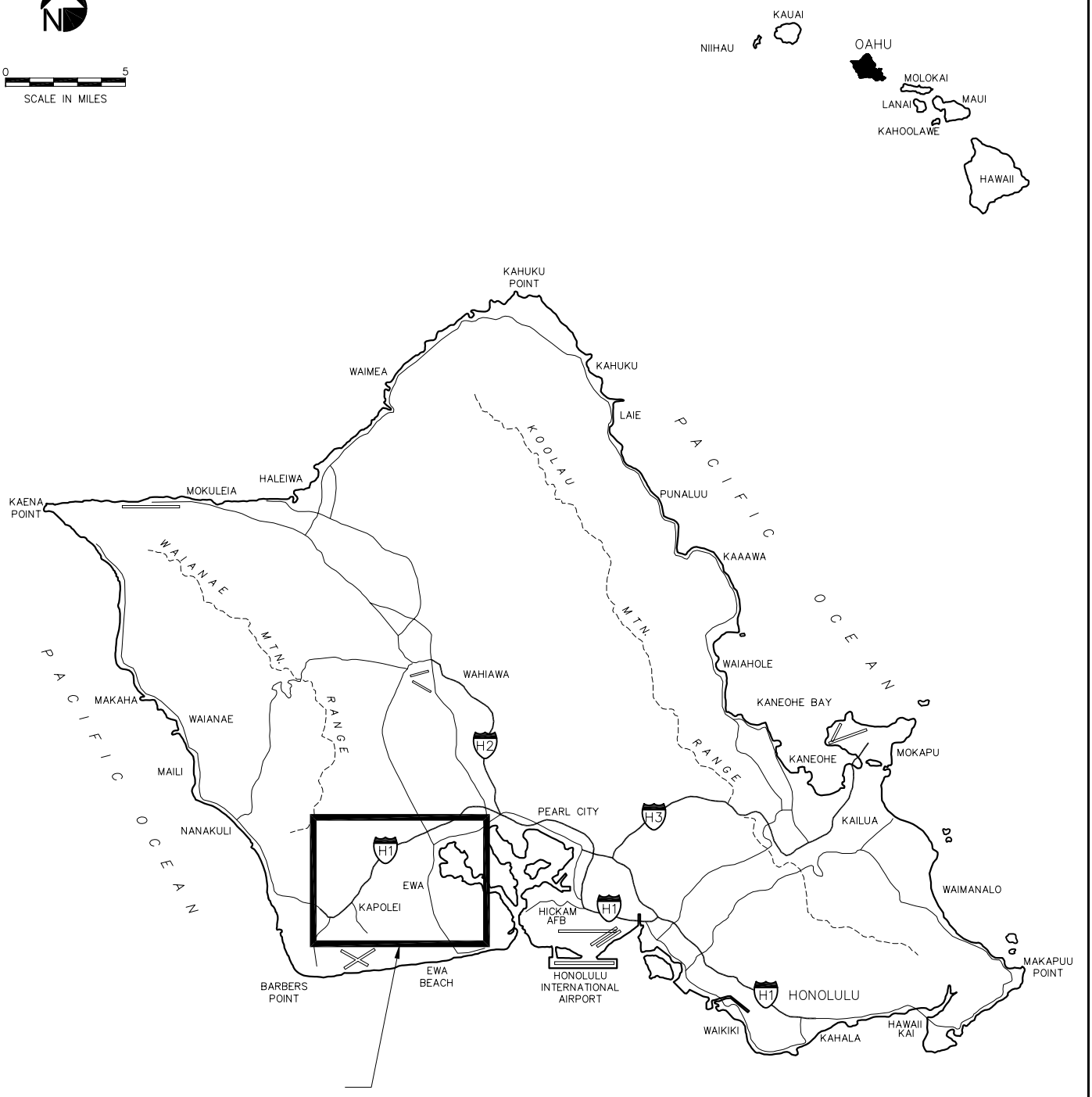
1.3.4 Geology and Hydrogeology

According to the United States Department of Agriculture (USDA) *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, the Site is underlain with one type of soil. The soil is classified as Honouliuli clay series, with a 0 to 2 percent slope. The Honouliuli series consists of well-drained soils on coastal plains on the island of Oahu in the Ewa area. The soils are developed alluvium derived from basis igneous rock material.

The profile of the soil is dark reddish brown, very sticky and very plastic clay throughout. The soil is neutral to mildly alkaline. Permeability is moderately slow; runoff is slow; and the erosion hazard is no more than slight. (USDA 1972).

1.3.5 Current Land Use

Currently, all parcels of the Site are being utilized for diversified agriculture production by Aloun Farms, Larry Jefts, or remain fallow. Crop production was observed during the Site reconnaissance in parcel 088, 005 and 008, and is scattered throughout the area with crops while the remaining land remains fallow.


N
0
5
SCALE IN MILES
KAUAI
NIIHAU
OAHU
MOLOKAI
LANAI
MAUI
KAHOOLAWE
HAWAII
KAHUKU POINT
WAIMEA
KAHUKU
LAIE
KOOLAU MTN. RANGE
PACIFIC OCEAN
HALEIWA
MOKULEIA
KAENA POINT
PUNALUU
KAAAWA
WAIANAE MTN. RANGE
WAIAHOLE
WAHIAWA
MAKAHA
WAIANAE
MAILI
NANAKULI
H2
KANEOHE BAY
KANEOHE
MOKAPU
PEARL CITY
H3
KAILUA
H1
EWA
KAPOLEI
HICKAM AFB
WAIMANALO
MAKAPUU POINT
BARBERS POINT
EWA BEACH
HONOLULU INTERNATIONAL AIRPORT
HONOLULU
WAIKIKI
KAHALA
HAWAII KAI

FIGURE

1-1

TMK: 1-9-1-018:005

TMK: 1-9-1-017:086

TMK: 1-9-1-016:008

TMK: 1-9-1-017:088

TMK: 1-9-1-017:071

LEGEND

Project Area Parcel Boundaries and Tax Map Key

NOTES

1. The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.
2. Projection: NAD 27
3. File:.Figure 2.dwg
4. Date:

SOURCES

1000 0 2000

Feet

amec

FIGURE

1-2

SECTION 2
HISTORICAL RECORDS REVIEW

Review of historical and present land use information sources was conducted to evaluate whether past or current practices involving the use, storage, treatment, generation, and/or disposal of hazardous substances or petroleum products may have taken place on the site; or if contamination on properties in the site vicinity may have impacted the subject site.

Various resources were reviewed to evaluate the historical use of the site and the adjacent land. AMEC reviewed several aerial photographs from 1949 through 1997, a United States Geological Survey (USGS) 7.5-minute series historic topographic map dated 1983, ownership records at the State of Hawaii Bureau of Conveyance, previously conducted environmental site investigations, and the EDR federal and state environmental listings.

2.1. AERIAL PHOTOGRAPHS

A review of historical aerial photographs of the property indicates the site was utilized for agriculture. Photos of the subject area are located in Appendix B.

1971

This photograph dated in January 3, 1971, is one of the earliest available photographs of the Site. The photograph indicates agricultural use of the property with sugarcane as the likely crop, as most of the historical agriculture on the island of Oahu was primarily sugar plantations. A reservoir is located within Parcel 088 near the location of the pesticide mixing and loading area.

1990

In an aerial photograph dated October 16, 1990, the property continues to be utilized for agriculture. Note the reservoir has been filled in and is used for crop production. Interior unpaved roads have been altered.

1998

In an aerial photograph dated 1998, this is the most recent photograph of the Site. The property continues to be utilized for agriculture, however, a fair portion of the land is fallow, and sugar cane is no longer the dominant crop.

2.3 State of Hawaii Bureau of Conveyance

AMEC searched property tax records at the State of Hawaii Bureau of Conveyances and did not find records pertaining to property transfer or lease agreements for the Site. AMEC searched for records within the microfiche collection for property transfer prior to 1987, and the electronic database from 1987 to the present date.

However, at the DLNR Land Division, AMEC did review the lease agreements between Aloun Farms and the DLNR Land Division. Within the Site file, the following was discovered:

- A letter dated January 1998 from the HDOH to Board of Land and Natural Resources indicating a site investigation was performed at the OSC pesticide mixing and loading area located within Parcel 088. The letter indicated USEPA Region IX tasked the HDOH Hazard Evaluation and Emergency Response (HEER) office to conduct soil sampling. The results of the soil sampling indicated elevated levels of dioxins and furans, as well as other contaminants of concerns.

- A letter dated November 21, 2000 from the HDOH to the DLNR indicated the Pesticide Mixing and Loading Facility is identified as a high priority, based upon two reports: the Preliminary Assessment in May 1993 and the Site Inspection dated July 2000.

- Although not a recognized environmental condition, a letter from the DLNR Division of Forestry and Wildlife dated January 28, 2002, indicated the presence of *Abutilon menziesii,* an endangered plant. The letter

requested no agricultural practice be performed in the western most area of Parcel 071.

Documents noted above are located in Appendix C.

2.4 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

OSC Pesticide and Mixing Area, TMK 1-9-1-017-088

An investigation was performed to "determine the lateral and vertical extent of soil contamination resulting from the use of herbicide and pesticides at the site" (Lockheed Martin/REAC, *Extent of Contamination, Oahu Sugar Company Site*, December 2000). According to the site history section of the report, the OSC Pesticide Mixing and Loading Area was first investigated in 1990 by the University of Hawaii and the Hawaii Department of Agriculture. Soil sampling around the mixing tanks identified and confirmed the presence of pesticides and herbicides. Also noted was a preliminary site assessment conducted by the HDOH in 1992 that included a document review, personal interviews, and a site visit. Results of this site assessment again confirm that the pesticides and herbicides were used onsite.

Two sampling events were performed at the OSC Pesticide Mixing and Loading Area. The first sampling event occurred in February 2000 where surface soils were collected and analyzed. The second sampling event occurred in June 2000, and soil samples were taken at depths ranging between 1-2 feet below ground surface, and 3-4 feet below ground surface. The results indicated the following:

- Highest concentration levels were located inside the "boiler house", as the boiler house appears to be a sink for drainage from beneath the other buildings and elevated tanks to the west. The boiler house appeared to receive drainage directly from the floor of the building;
- Higher concentration levels were generally detected under the elevated tanks onsite; and

- As the depths of soil samples increased, concentration levels associated with the soil samples generally decreased as the depth of the soil sample location increased.

- Concentrations of dioxins in soil were above the USEPA Region 9 Preliminary Remediation Goal (PRG) for residential soil 0.0039 ppb and above the Office of Solid Waste and Emergency Response (OSWER) cleanup level goal of 1 part per billion (ppb) toxicity equivalents for residential sites. Dioxin concentrations ranged between 0.065 to 333.6 ppb.

2.5 ENVIRONMENTAL DATA RESOURCES FEDERAL AND STATE LISTINGS

This section reviews the applicable federal, state, and local lists as well as available files of reported hazardous waste sites and hazardous substance/petroleum product sources and releases. Environmental Data Resources, Inc. (EDR) provided the federal and state environmental release listings. The EDR's database is continually updated and is considered one of the most comprehensive in the industry. The complete EDR output is provided in Appendix D and results are summarized below.

EDR was requested to provide data on the land parcel designated by the following coordinates: Latitude (north), 21.349400-21°20'57.8" and 158.044100-158°2'38.8" Longitude (west). This was the only set of coordinates requested for EDR output based on the following information.

- The requested EDR output is near the center of Parcel 071 and 088, and is situated south of the remaining parcels;

- The remaining parcels north of the central location are within the EDR search criteria;

- It is not likely areas north of the H-1 Freeway would have federal and state environmental release listings, as the areas north are primarily agricultural, and reserved for the development of the University of Hawaii West Oahu Campus and encompass a large quantity of land; and

- It was more likely areas to the south of the central location may have federal and state environmental release listings which may impact the property due to areas south of the property being urbanized.

The EDR list of Federal and Hawaii State Regional databases is provided below:

Federal ASTM Standard Databases:

- National Priorities List (NPL)
- Proposed NPL
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- CERCLIS No Further Remedial Action Planned (CERC-NFRAP)
- Resource Conservation and Recovery Act (RCRA) Corrective Actions (CORRACTS)
- Resource Conservation and Recovery Information System - treatment, storage, and disposal facilities (RCRIS-TSD)
- Resource Conservation and Recovery Information System – large quantity generators (RCRIS-LQG)
- Resource Conservation and Recovery Information System – small quantity generators (RCRIS-SQG)
- Emergency Response Notification System (ERNS)

Federal ASTM Supplemental Databases:

- Superfund (CERCLA) Consent Decrees (CONSENT)
- Records of Decision (ROD)
- National Priority List Deletions (Delisted NPL)

- Facility Index System / Facility Identification Initiative Program Summary Report (FINDS)
- Hazardous Materials Information Reporting System (HMIRS)
- Material Licensing Tracking System (MLTS)
- Mines Master Index Files (MINES)
- NPL Liens
- PCB Activity Database System (PADS)
- Federal Lands - administered by the U.S. Department of Defense (DOD)
- RCRA Administrative Action Tracking System (RAATS)
- Toxic Chemical Release Inventory System (TRIS)
- Toxic Substance Control Act (TSCA)
- Section 7 Tracking Systems (SSTS)
- Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) / Toxic Substances Control Act (TSCA) Tracking System

State ASTM Standard Databases:

- State Hazardous Waste Sites List (SHWS)
- Solid Waste Facility / Land Fill (SWF/LF) including facilities permitted as incinerators or transfer stations
- State of Hawaii Department of Health (HDOH) Leaking Underground Storage Tank (LUST) Database
- HDOH Registered Underground Storage Tanks (UST) Database

State or Local ASTM Supplemental Databases:

- HDOH Hazard Evaluation and Emergency Response (HEER) Office State Spills List (SPILLS)

A summary of the contents of each of these lists is provided in Appendix D. These lists are reviewed to document the location of known federal and state Superfund sites, or other known hazardous waste sites in proximity to the site following ASTM search distance guidelines. AMEC uses most current ASTM Standard E1527-00 as the basis for delineating a study area during the database review (ASTM, 2000).

2.5.1 EDR Summary Results

Results indicating potential recognized environmental conditions are discussed below. Results of the EDR review confirm two sites are listed in the Solid and Hazardous Waste Site (SHWS) database, and one site in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database.

2.5.1.1 Subject Site

Solid and Hazardous Waste Site (SHWS) Database

The Oahu Sugar Company (OSC) Pesticide Mixing and Loading Area is listed in the Solid and Hazardous Waste Sites (SHWS) database (TMK 1-9-1-017-088). This site is also listed on the federal CERCLIS list. The Ewa Sugar Mill/Oahu Sugar Company is listed as the potential responsible party.

CERCLIS-NFRAP Database

The OSC Pesticide Mixing and Loading Area is listed in the CERCLIS-NFRAP database. The potentially responsible party listed is the Ewa Sugar Mill/Oahu Sugar Company. The Pesticide Mixing and Loading area is cross-referenced under the SHWS database.

2.5.1.2 Properties within the Vicinity of the Subject Site

SHWS Database

One facility, Ewa Repair Shop/Tesoro, located at 91-1669 Fort Weaver Road is listed in the SHWS database. The Ewa Repair Shop/Tesoro is located within one to two miles east of the central location. Runoff from the facility is not likely to impact the Site, as the Site location is approximately two miles west, and is at a higher elevation than the facility.

HDOH LUST Database

One leaking underground storage tank, listed in the HDOH LUST database, was reported within ½ to 1-mile radius of the Site. According to the HDOH LUST database, the cleanup activities have been completed for this facility. It is not likely the petroleum products from the leaking underground tank contributed to a recognized environmental condition at the subject Site, as the facility is located at a lower elevation, and the proximity is in excess of ½-mile.

Federal Lands Database

Based on the EDR's database search, there is one DoD facility (Barbers Point Naval Air Station) located 1 to 2 miles south of the Site listed in the Federal Lands database: It is not likely Barbers Point Naval Air Station has contributed to a recognized environmental conditions at the subject Site as the facility is located in excess of 1 mile south of the Site.

There were no listings in any other databases searched within ASTM proximity guidelines. It is not likely a recognized environmental condition from listings for properties within the vicinity of the Site would contribute to a recognized environmental condition to the Site.

SECTION 3
SITE RECONNAISSANCE

The objective of a site reconnaissance is to obtain visual information identifying recognized environmental conditions in connection with the property. In accordance with the original contract, and Change Proposal No. 2, and authorized by the HDOH, a site reconnaissance was conducted on the following Tax Map Key (TMK) parcels: 1-9-1-017-071, 1-9-1-017-088, 1-9-1-071-086, 1-9-1-016-008, and 1-9-1-018-005. Observations were photographed where possible.

Site Reconnaissance for TMK 1-9-1-017-071 and 1-9-1-017-088

On August 5, 9, and 10, 2004, AMEC personnel performed a site reconnaissance for TMK No. 1-9-1-017-071 and 1-9-1-017-088 of the Site. The periphery of the property was observed and viewed from all adjacent public thoroughfares.

A majority of the parcel 088 and the eastern portion of 071 remain fallow without brush (less than 2-feet in height), or have low-lying crops (less than 2-feet in height). For fallow areas not overgrown by brush, or areas with low-lying crops visual observation of those areas were conducted from unpaved roadways by vehicle.

Unpaved roadways at the southern boundary of the property, adjacent to the golf course, were gated and locked and not accessible by vehicle. Personnel walked along unpaved roadways at the southern boundary of the property for visual observation.

The western portion of parcel 071 is fallow, however, it is overgrown with brush ranging two to three feet in height. Personnel inspected this portion of the parcels from the perimeter, along the exterior roadways to observe recognized environmental conditions. Personnel did not enter the brush area of the parcel, as the DLNR has posted signs delineating the brush portion of parcel 71 as a bird habitat and nesting area.

The following are the significant findings of the Site Reconnaissance:

- The OSC Pesticide Mixing and Loading Area observed in TMK 1-9-1-017-088, is located along an unpaved road. The area is secured with chain link fencing approximately 6-feet in height, and secured with locks. Above ground storage tanks were observed from the exterior of the fenced location. On August 27, 2004, personnel inspected within the fenced location of the OSC Pesticide Mixing and Loading Area and did not observe any significant changes to the property condition as noted in Figure 1 of the Lockheed Martin/REAC report dated December 2000.

- Approximately 125 feet east south east of the OSC Pesticide Mixing and Loading Area is along an unpaved road leading into a field where a water standpipe was observed. It is suspected this location currently serves as pesticide mixing and loading area for farm equipment, as recently used pesticide containers were piled near a 2-inch diameter water pipe.

- Standing water was observed approximately 125 feet east south east of the OSC Pesticide Mixing and Loading Area. The standing water was located approximately 20 feet south of the suspected pesticide mixing and loading area above.

With the exceptions noted above, result of the site reconnaissance indicates no other recognized environmental conditions.

- No underground storage tanks (vent pipes, prior excavation depressions) were observed.

- No strong, pungent or noxious odors were identified throughout the parcels.

- No drums, identified or unidentified, were observed on the parcels.

Site Reconnaissance for TMK 1-9-1-016-008, 1-9-1-018-005 and 1-9-1-017-086

On August 26 and 27, 2004, AMEC personnel performed a site reconnaissance for TMK No. 1-9-1-016-008, 1-9-1-018-005 and 1-9-1-017-086 of the Site. The periphery of the property was observed and viewed from all adjacent public thoroughfares.

Parcel 1-9-1-016-008 and 1-9-1-018-005 remain fallow without brush (less than 2-feet in height). No crops were observed on the property at the time, though it appeared the area had recently been prepared for planting. Along the northern portion of these two parcels, a small 100-foot wide strip parallel to the H-1 freeway is overgrown with brush approximately three to four feet in height. Personnel inspected this portion of the brush by walking along the perimeter of the brush area and observed no recognized environmental conditions.

Parcel 1-9-1-017-086 remains fallow without brush. No crops were observed on the parcel at the time of the reconnaissance. A concrete lined culvert crossed the northwest portion of the parcel, extending along the north boundary toward the southwest. From the ground surface, the culvert extends downward approximately 8-feet. The culvert is most likely an old irrigation flume used to transport water to other area.

The site reconnaissance for TMK 1-9-001-016:008, 1-9-001-018:005 and 1-9-001-017:086 indicates no significant recognized environmental conditions.

- No underground storage tanks (vent pipes, prior excavation depressions) were observed.
- No strong, pungent or noxious odors were identified throughout the parcels.
- No drums, identified or unidentified, were observed on the parcels.

SECTION 4
SUMMARY OF FINDINGS

AMEC has performed an enhanced Phase I Environmental Site Assessment of the subject site to identify and evaluate evidence that may indicate environmental hazards at the Site due to past or current management of chemicals or other materials that, if released or not properly controlled, could present a risk to human health or the environment.

The findings of this investigation are based upon the records review and visual observations of the Site Reconnaissance. The General Findings below are to address recognized environmental conditions which are common to all parcels associated with the Site. Specific Findings are recognized environmental conditions unique to the parcel.

Only TMK 1-9-1-017-088 had specific recognized environmental conditions beyond the General Findings. TMK No. 1-9-1-017-071, 1-9-1-017-086, 1-9-1-016-008, and 1-9-1-018-005 did not have a recognized environmental condition associated with the parcel beyond those noted below in the General Findings

General and specific findings are noted within this section.

4.1 GENERAL FINDINGS

ASTM Standard 1527-00, Section 1.1.1 requires environmental professionals to assess the potential of any hazardous substance or petroleum products on a property. For example, the continued lawful practice of pesticide and herbicide application to the parcels during the lengthy history of agricultural practice in this region requires that pesticides and herbicides be designated as recognized environmental concerns.

Data from samples collected at the OSC Pesticide Mixing and Loading Area and agricultural field locations indicate dioxin concentration levels ranging from 0.065-333.6 ppb (above both the Region 9 residential soil PRG of 0.0039 ppb and the USEPA Office of Solid Waste Emergency Response (OSWER) Directive

of 1 ppb). Based upon previously collected data, and information indicating use of pesticides and herbicides throughout the Site history, it is reasonable to conclude elevated concentrations of dioxins, pesticides and herbicides above residential PRGs exist throughout the Site.

4.2 Specific Findings for TMK 1-9-001-017:088

Oahu Sugar Company (OSC) Pesticide Mixing and Loading Area

The OSC Pesticide Mixing and Loading Area located within TMK 1-9-1-017-088 has elevated concentrations of hazardous substances associated with pesticides and herbicides. As listed in the CERCLIS-NFRAP and SHWS database, the facility has been identified by EDR to be located on Renton Road. Further inquiry to the USEPA confirms the EPA ID number for the facility identified by EDR to be on Renton Road is actually located approximately 1-mile north of the location identified by EDR on Renton Road.

According to previous investigations of the OSC Pesticide Mixing and Loading Area, levels of highest concentrations are located near above ground storage tanks and the “boiler house” where the storage of pesticide and herbicides would most likely have occurred. The release of the pesticide and herbicides from the above ground storage tanks and boiler house appear to be the result of spillage, which may have occurred during the transfer of pesticides or herbicides from the mixing tanks into the farm equipment, or from mixing activities.

AMEC reviewed the laboratory analytical data for contaminants identified in the report prepared by Lockheed Martin/REAC and compared the contaminant concentration to USEPA Region 9 residential soil PRGs. Dioxin concentrations were compared to USEPA Region 9 PRGs, as well as the USEPA OSWER Directive. The following contaminants have soil concentrations above the respective residential soil PRG:

- PCDD/PCDF as dioxin/dibenzofluran total toxicity equivalents ranging from 0.065-333.6 ppb from all samples were detected above the USEPA Region 9 residential soil PRG of 0.0039 ppb and OSWER Directive PRG of 1 ppb;

- Atrazine concentration at 86 mg/kg from sample S-1 was detected above the USEPA Region 9 residential soil PRG of 2.2 mg/kg;
- Trifluran concentration of 190 mg/kg from sample S-1 was detected above the USEPA Region 9 residential soil PRG of 63 mg/kg;
- Dieldrin concentration of 0.029 from sample S-1 was detected above the USEPA Region 9 residential soil PRG of 0.03 mg/kg;
- Pentachlorophenol concentrations ranging from 7.5-17 mg/kg from three sample locations were detected above the USEPA Region 9 residential soil PRG of 3 mg/kg;
- Arsenic concentrations ranging from 30-160 mg/kg from five sample locations were detected above the USEPA Region 9 residential soil PRG of 22 mg/kg; and
- Manganese concentrations ranging from 1,600-2,200 mg/kg from eight sample locations were detected above the USEAP Region 9 residential soil PRG of 1800 mg/kg .

The individual contaminants listed above were reviewed spatially, assigning concentration data to corresponding sample location and depths. A review of sample locations and concentrations per contaminant at the pesticide mixing and loading area, indicates PCDD/PCDF as the only contaminant detected from every sample throughout the area. Remediation of areas in which dioxin concentrations are above the OSWER Directive of 1 ppb would remediate all areas that are of concern due to other Site COPCs.

The location designated by sample S-1 is a composite of three locations southeast of the “Boiler House” (see Figure 1). At location S-1, atrazine (86 mg/kg), trifluran (190 mg/kg), Dieldrin (0.049 mg/kg) pentachlorophenol (15 mg/kg), and arsenic (39 mg/kg) were detected above USEPA Region 9 residential soil PRGs. Atrazine, trifluran, and dieldrin were not detected above USEPA Region 9 residential soil PRGs at any other location.

Elevated concentrations of pentachlorophenol were detected above USEPA Region 9 residential soil PRGs in three surface (0-8 inches below ground surface) sample locations S-1 (15 mg/kg), SM-1 (17 mg/kg), and SM-2 (7.5 mg/kg). Elevated concentrations of pentachlorophenol were also detected above USEPA Region 9 residential soil PRGs at depths of 1-2 feet below ground surface from S-1 (22 mg/kg), SM-1 (310 mg/kg) and SM-4 (14 mg/kg).

Elevated manganese concentrations were detected above residential soil PRGs in eight of the fifteen surface soil samples collected. Although above the USEPA Region 9 residential soil PRG of 1800 mg/kg, the Pesticide Mixing and Loading Area is located in a region characteristically known for soil with high manganese concentration. According to *Managing Manganese Toxicity in Former Sugarcane Soil on Oahu, June 1998*, published by the University of Hawaii, portions of the Ewa plain have high reserves of manganese. Soil levels of 1-4% total manganese is not uncommon. The manganese concentrations, though high, is an inherent characteristic of the native soil, and unlikely to be a contaminant of concern.

Suspected Pesticide Mixing and Loading Area

As identified during the site reconnaissance, an area suspected to be used as a pesticide mixing and loading area by the current tenant was observed within TMK 1-9-1-017-088. During the site reconnaissance, the suspected pesticide mixing and loading area was observed to have a water source, with a 2-inch diameter PVC pipe with 2-inch hose, and the area had approximately eight 5-gallon recently emptied pesticide containers stockpiled at the Site. The location of this suspected pesticide mixing and loading area is approximately 100 feet east of the OSC Pesticide Mixing and Loading Area, along an unpaved dirt road, north of the area of standing water. Photos 010 to 013 taken during the Site Reconnaissance are presented in Appendix E.

Standing Water at Southeast of the OSC Pesticide Mixing and Loading Area

As identified during the site reconnaissance, an area near the OSC pesticide mixing and loading facility was observed within TMK 1-9-1-017-088 to have standing water. It is unclear from the historical review or the site reconnaissance

the reason for standing water in this area. Although the standing water is located in a depressed area, which appears to collect some surface runoff, standing water was observed on three separate site reconnaissance visits. This site may be a potential environmental condition, as the presence of the standing water is within 20 feet of the suspected pesticide mixing and loading area, and the vegetation within the standing water appears stressed. If the suspected pesticide mixing and loading area has elevated pesticide contamination as a result of spillage, this spillage may have runoff and impacted the standing water on the property.

SECTION 5
RECOMMENDATIONS

This section provides recommendations regarding recognized environmental conditions noted in Section 4, titled "Summary of Findings". The recommendations outline a conceptual approach for further environmental investigation, and provide a rough order magnitude of anticipated costs.

5.1 GENERAL FINDING – ELEVATED CONCENTRATIONS OF DIOXINS, PESTICIDES AND HERBICIDE IN ALL PARCELS (TMKS 1-9-1-017-071, 1-9-1-017-088, 1-9-1-017-086, 1-9-1-016-008, AND 1-9-018-005)

The Site has historically been used for agriculture. Common agricultural practices included the use of various pesticides and herbicides. Dioxins are a byproduct/contaminant of pesticide and herbicide production and therefore are frequently co-located.

Based on the past agricultural use of the Site and available data, it is likely that concentrations of pesticides, herbicides and dioxins above regulatory levels of concern exist at the Site.

Data from sample locations 15-20 feet beyond the fenced area of the OSC Pesticide Mixing and Loading Area indicate five samples with dioxin concentrations exceeding the USEPA Region 9 residential soil PRG of 0.0039 ppb. Although these concentrations are above USEPA Region 9 residential soil PRG, the OSWER (Directive 9200.4-6) has proposed 1 ppb or less an acceptable dioxin clean-up level. According to the OSWER Directive 9200.4-6, one part per billion ppb is generally used as a starting point for setting clean-up levels for "CERCLA removal sites and as a PRG for remedial sites for dioxin in surface soil involving a residential exposure scenario". The OSWER Directive 9200.4-6 recommends the clean-up level of 1 ppb "unless extenuating site specific circumstances warrant different levels".

No data exists to confirm or deny the presence of dioxin contamination in other areas of the site other than the OSC Pesticide Mixing and Loading Area. Further characterization of these areas is recommended.

Since historical review and Site reconnaissance of the parcels did not indicate the presence of other pesticide and herbicide facilities (with the exceptions noted in the Specific Findings in Section 4), characterization for vertical and lateral extent of releases or "hot spots" are not necessary. It is assumed that pesticides and herbicides applied to the Site were distributed in a relatively uniform manner. Therefore, to assess the risk to human health as a result of legally applied pesticide throughout the Site, the mean concentration of dioxins, pesticides, and herbicides will be required. To obtain the mean concentration, the following general sampling strategy is recommended:

- One composite sample should be collected per TMK parcel;
- The composite sample should consist of a minimum of 50 points, collected on an evenly spaced grid for each TMK;
- Each point sample will be collected from the surface at 0-6 inches below ground surface;
- An equal amount of soil should be obtained from each point, and thoroughly homogenized with the 50 points; and
- The composite sample will be obtained after mixing, and analyzed for dioxins, pesticides and herbicides.

The results of the composite sample will be statistically representative sample of the mean concentration of contaminants across the parcel. The method noted above is based upon the following assumptions:

- This sampling method will not characterize lateral and vertical extent of areas with potential high contamination; and

- The mean concentration is representative of contaminant levels across the entire site, and therefore may only be used to assess the Site as a whole.

For the East Kapolei Site composed of five separate parcels, approximately five (5) composite samples will be required. Laboratory analytical costs for each composite sample to analyze for pesticides, herbicides and dioxins is estimated at $2,000. For five composite samples, total analytical cost is estimated at $10,000.

Given the area of the parcels, it is estimated approximately two technicians, at twelve man-hours/person/day at a rate of $65/hour, will be able to collect 50 point samples, homogenize, and ship the samples. It is estimated each parcel will cost $1,560 in labor, and therefore for five parcels, it is estimated $7,800 in direct labor.

It is estimated an additional $10,000 in consulting fees are required for sampling plans, the formulation of data quality objectives, interpretation of the analytical data, and a report. The total estimate for this task is $27,800.00.

5.2 OSC Pesticide Mixing and Loading Area

The OSC Pesticide Mixing and Loading Area is listed in Section 4, titled "Summary of Findings" as a recognized environmental concern. The most prevalent contaminant of concern identified in all the samples is Chlorinated Dibenzo-p-dioxins (CDDs). Other contaminants of concern have also been identified along with the CDDs, however, since the dioxin contaminated soil is co-located with other contaminants listed in Section 4, the recommendations for the other contaminants listed in Section 4 will be the same for CDDs. Therefore, the focus of the recommendation for this site will focus on CDDs.

CDDs are a family of 75 different compounds commonly referred to as polychlorinated dioxins. The dioxin contamination at this facility is likely to have been released to the environment through the spillage of pesticide, herbicide, or as a degradation product of pentachlorophenol at the facility.

Although located above a drinking water aquifer, and up-gradient from wells located south of the property along Renton Road, the potential groundwater exposure pathway is expected to be minimal at the site since dioxins from pesticides and herbicides generally adhere to the soil particles.

Subsurface boring data from the report prepared by Lockheed Martin/REAC indicates a general trend of decreasing concentration of contaminants with increasing subsurface depth. For subsurface boring S-1c, the concentrations of dioxins range from 271 ppb at 1-2 feet bgs, 33.4 ppb at 2-3 bgs, and 42 ppb at 3-4 feet bgs.

According to the OSWER Directive 9200.4-6, one part per billion ppb is generally used as a starting point for setting clean-up levels for CERCLA removal sites and as a PRG for remedial sites for dioxin in surface soil involving residential exposure. Although PRGs for dioxins established by OSWER Directive 9200.4-6 are greater than USEPA Region 9 residential soil PRGs, the OSWER established 1 ppb PRG for dioxin was used in this assessment as the clean-up level goal for the evaluation of remedial alternatives.

A comparison between clean-up levels established by OSWER and the existing sampling data, indicates that remedial action is necessary for areas within this facility which exceed the 1 ppb. Three remedial options were considered and evaluated using the Engineering Evaluation and Cost Analysis (EECA) format. Specific details regarding the EECA are located in Appendix F. Three (3) remedial alternatives were considered for the OSC Pesticide Mixing and Loading Area:

1. Excavation, transport and incineration of dioxin contaminated soil at an off-island approved facility;
2. Excavation and incineration of dioxin contaminated soil on-site, returning the soil to the excavation; and
3. Soil Cover.

This remedial option would consist of excavation of the dioxin contaminated soils and thermal incineration of soil at a staging area on-site, and returning the

remediated soil back to the excavation. The general task activities under this remedial option include:

- site survey
- mobilization of incineration equipment;
- clearing and grubbing;
- soil excavation;
- confirmation sampling; and
- incineration to remediate excavated soils;

Prior to initiating site activities, a site survey by a Land Surveyor licensed in the State of Hawaii should be performed to delineate the area of concerns for implementation of cleanup actions. Accurate mapping of the areas will allow more precise and accurate determination of excavation areas and volumes, staging areas locations, and boundary limits for areas of concern. The survey will minimize lateral and vertical over excavation, which will minimize costs of additional packaging, transport, and thermal incineration of the excavated soils.

The thermal incineration equipment necessary to remediate dioxin contaminated soil will have to be mobilized to the OSC Pesticide Mixing and Loading Area from an off-island location.

Clearing and grubbing of the brush will be required prior to excavation. The brush should be cut as low to the ground surface, mulched and spread out at a nearby site. Tree roots larger than 3-inches in diameter will have to be removed. Soil associated with root removal will require removal to the extent feasibly possible prior to disposal.

The volume of soil removed is based on dioxin levels from the December 2000 sampling results, where the depth and extent of excavation is designed to capture soils with dioxin concentrations of 1 ppb TEQ[1] or greater. Two “hot

[1] Dioxin/dibenzofuran total toxicity equivalents

spots" identified in Figure F-1 would be excavated to 5 feet below ground surface (bgs). The two "hot spots" area identified as the area surrounding the elevated mixing tanks and the area where the "Boiler House" is located. These two regions are approximately 3,700 ft^2 and 2,100 ft^2, respectively. Sampling data obtained in these hot spot regions shows dioxin concentrations of greater than 1 ppb to at least four (4) feet in depth. These areas would be excavated to five (5) feet bgs in an effort to capture soils with dioxin concentrations greater than 1 ppb. The total volume of excavated soil from these two "hot spots" yields approximately 1,074 "bank" cubic yards (BCY). After excavation, the soil is anticipated to expand as air and water void volume increases. The soil expansion factor for clay is assumed at 30%, and therefore after excavation, the soil is anticipated to expand in volume to approximately 1,396 "loose" cubic yards (LCY).

The remaining soil area at the Site (approximately 37,900 ft^2) would be excavated to 2 feet bgs for a volume of 2,807 BCY. Using the expansion factor noted above, a volume of 3,650 LCY is anticipated. The total volume of excavated soil for the entire site is estimated at 5,046 LCY (approximately 7,612 tons, at 1.5 tons/CY). Soils will be incinerated at an approved incineration facility established near the site. After incineration, remediated soil will be returned to the excavated site and subsequently covered with sod grass.

After the completion of excavation activities, confirmation sampling will be conducted at the bottom of the excavation areas to verify that the remaining on-site soils in the excavation areas meet the cleanup level of 1 ppb dioxin. It is anticipated only the mean concentration across the site is required, and therefore a single composite sample will be collected from twenty random points within the excavation area.

According to Environmental Chemical Corporation, Inc., a subcontractor with the specialized incineration equipment, indicated incineration fees would cost approximately $3,860,700 including the mobilization of the equipment to the OSC Pesticide Mixing and Loading Area. The total cost (including site survey, clearing, and grubbing) is estimated at $3,930,900.

5.3 SUSPECTED PESTICIDE MIXING AND LOADING AREA

Sampling is recommended for the Suspected Pesticide Mixing and Loading Area to confirm or deny elevated concentrations of pesticides and herbicides mixed at this location. The suspected pesticide mixing and loading area is approximately 20 feet wide by 20 feet in length. It is recommended a single surface soil composite sample be collected from 20 collection points distributed across the suspected area. The composite sample should be submitted to a laboratory and analyzed for pesticide, herbicide, and dioxins.

The results of the composite sample will be a statistically representative sample of the mean concentration of contaminants across the suspected pesticide mixing and loading area (See Photo 010 and 013 in Appendix E). The following composite sample will be used to confirm the presence of contaminants, and provide a quantitative mean to assess levels of contamination throughout the area. The composite sample is based upon the following assumptions:

- This sampling method will not characterize lateral and vertical extent of areas with potential high contamination; and
- The mean concentration is representative of contaminant levels across the entire site, and therefore may only be used to assess the area as a whole.

Laboratory costs for the composite sample to analyze for pesticides, herbicides and dioxins is estimated at $2,000. It is estimated approximately one technician will require four man-hours at a rate of $65/hour, will be able to collect 20 point samples, homogenize, and ship the samples. It is estimated this composite sample will cost $2,260 in labor and analytical cost.

It is estimated an additional $5,000 in consulting fees are required for a brief sampling plan, interpretation of the analytical data, and a report. The total estimate for this task is $7,260.00.

5.4 STANDING WATER AREA LOCATED NEAR SUSPECTED PESTICIDE MIXING AND LOADING AREA

One discrete water and one sediment sample is recommended for the Standing Water Area to confirm or deny elevated concentrations of pesticides and herbicides which may be the result of runoff contributed from the Suspected Pesticide Mixing and Loading Area. The suspected pesticide mixing and loading area is approximately 20 ft north of the Standing Water (See Photo 013 in Appendix E).

It is recommended one composite sediment sample be collected from 10 point locations in the standing water near the stressed vegetation at the southern boundary of the suspected pesticide mixing and loading area. If soil runoff from the suspected pesticide mining and loading area has migrated to the standing water location, the soil runoff would most likely still contain concentrations of pesticides, herbicides, and dioxins and impact the standing water. [Pesticides, herbicides, and dioxins have a strong tendency to adhere to soil particles even in sediments. However, one water sample should be collected near the stressed vegetation at the southern boundary of the suspected pesticide mixing and loading area.] The data collected from the composite sample will be used to confirm or deny the presence of pesticides, herbicides, and dioxins above PRGs.

Laboratory analytical costs for the composite sample to analyze for pesticides, herbicides, and dioxins is estimated at $2,000. It is estimated approximately one technician will require four man-hours at a rate of $65/hour, to collect the composite sediments sample and discrete water sample. It is estimated this composite sample will cost $2,660 in labor and analytical cost.

It is estimated an additional $5,000 in consulting fees are required for a brief sampling plan, interpretation of the analytical data, and a report. The total estimate for this task is $7,660.00.

The following is a summary table of recommendations for the Site with associated costs:

Table 5-1
Summary of Recommendations and Associated Costs

Environmental Recommendations	Estimated Cost
General Finding – Elevated concentrations of Dioxins, Pesticides and Herbicide in All Parcels (TMKs 1-9-1-017-071, 1-9-1-017-088, 1-9-1-017-086, 1-9-1-016-008, and 1-9-018-005)	$27,800.00
OSC Pesticide Mixing and Loading Area	$3,930,300.00
Suspected Pesticide Mixing and Loading Area	$7,260.00
Standing Water Area located near Suspected Pesticide Mixing and Loading Area	$7,660.00

SECTION 6
LIMITATIONS

The findings, observations, conclusions, and recommendations of this report are limited by the technical requirements specified in the non-emergency response contract (ASO Log No. 02-131) between the State of Hawaii Department of Health (HDOH) and AMEC Earth and Environmental (AMEC) effective December 4, 2001. The findings, observations, conclusions, and recommendations presented herein solely identify and evaluate evidence that may indicate that environmental hazards exist at the Site due to past or current management of chemicals or other materials that, if released or not properly controlled, could present a risk to human health or the environment.

In preparing this report, AMEC relied on information derived from visual reconnaissance, governmental agencies, computer databases, and personal interviews. Except as set forth in this report, AMEC made no independent investigations as to the accuracy and completeness of the information derived from the listed sources. AMEC assumed that all information obtained during the course of the investigation is accurate and complete.

All findings, observations, conclusions, and recommendations stated in this report are based on facts; circumstances; applicable federal, state and local laws, rules, and regulations; and generally accepted national standards for such services in existence at the time that the report was prepared. Topics not explicitly discussed within this report should not be assumed to have been investigated or tested. This service does not guarantee current compliance with federal, state, or local laws, rules, or regulations.

AMEC has prepared this document solely for the use and benefit of HDOH and State of Hawaii Department of Hawaiian Home Lands (DHHL). Any use of this document or information herein by persons or entities other than the HDOH or DHHL without the express written consent of AMEC will be at the sole risk and liability of said person or entity, and AMEC will not be liable to such persons or entities for any damages resulting therefrom. It is understood that this document may not include all information pertaining to the described site.

SECTION 7
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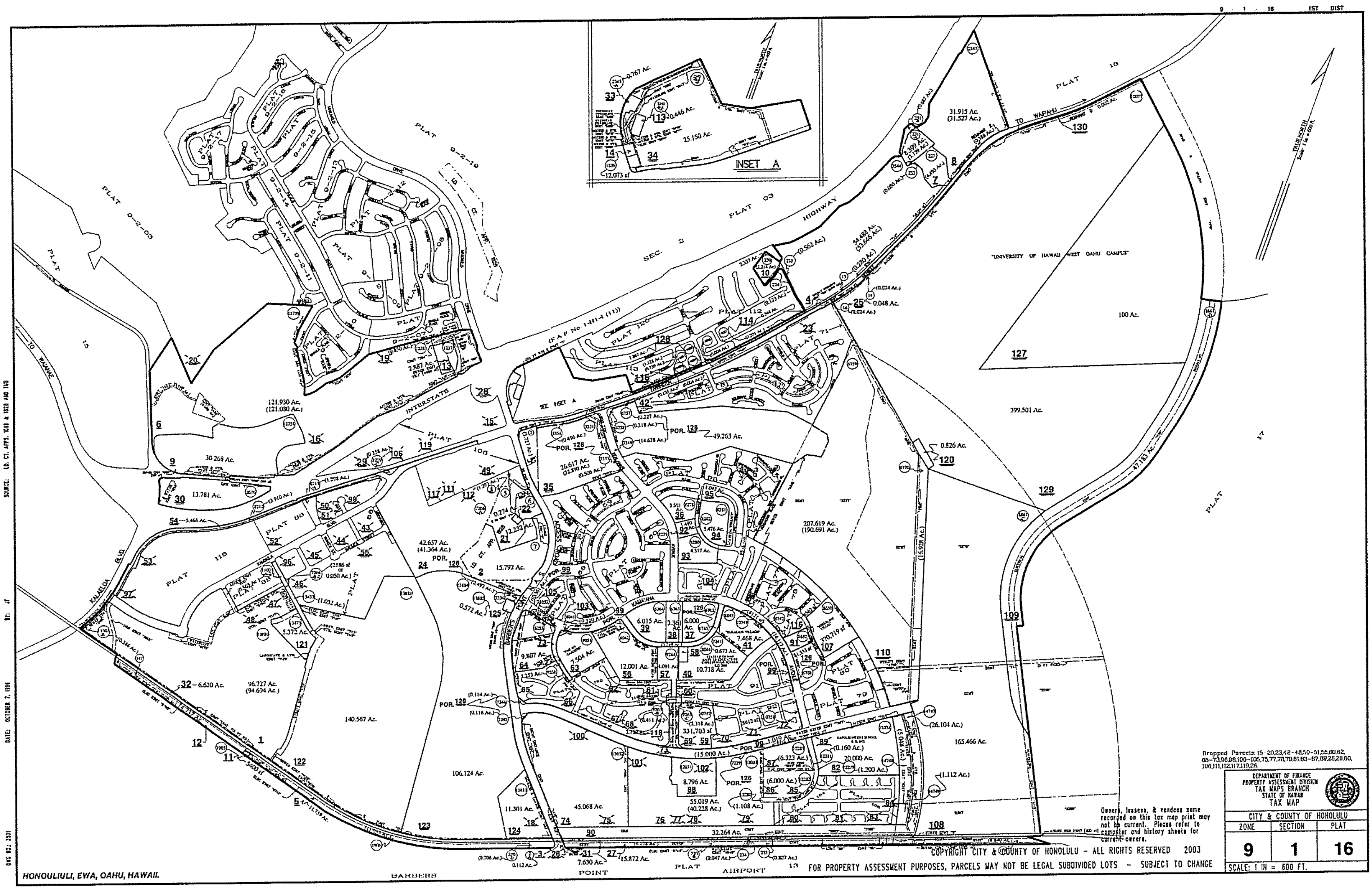
APPENDIX A

Parcel Map and Legal Information



9 1 18 1ST DIST
INSET A
Dropped Parcels: 15-20,23,42-48,50-51,55,60,62, 65-73,90,98,100-105,75,77,78,79,81,83-87,89,28,29,80, 106,111,112,117,119,26.
DEPARTMENT OF FINANCE
PROPERTY ASSESSMENT DIVISION
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP
CITY & COUNTY OF HONOLULU
ZONE 9 SECTION 1 PLAT 16
SCALE: 1 IN = 600 FT.
Owners, lessees, & vendees name recorded on this tax map print may not be current. Please refer to computer and history sheets for current owners.
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FOR PROPERTY ASSESSMENT PURPOSES, PARCELS MAY NOT BE LEGAL SUBDIVIDED LOTS - SUBJECT TO CHANGE
HONOULIULI, EWA, OAHU, HAWAII.


INSET
INTERSTATE HIGHWAY
KUNIA ROAD
FORT WEAVER ROAD
PEARL HARBOR
LAULAUNUI ISLAND
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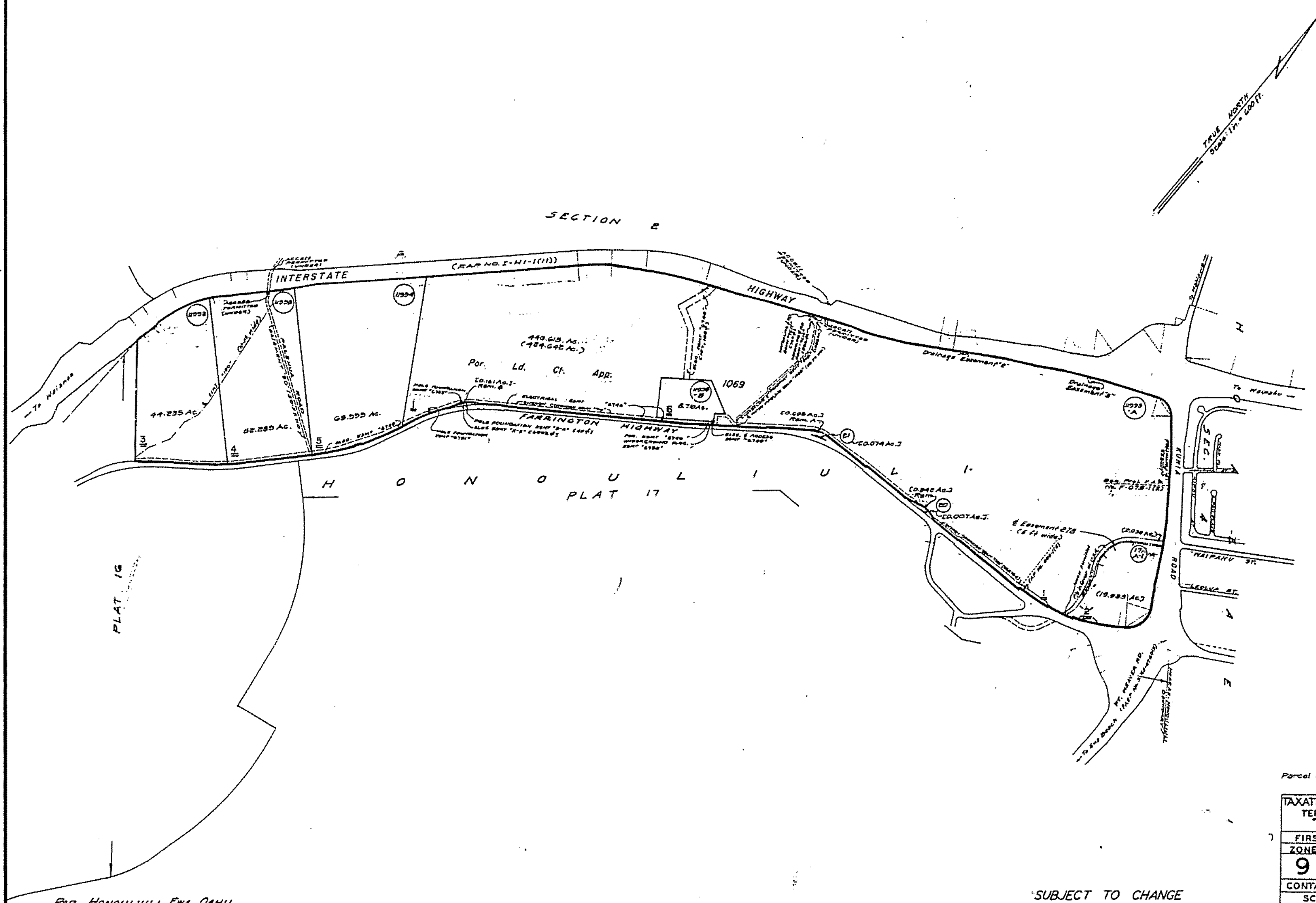
PROPERTY ASSESSMENT DIVISION
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP
CITY & COUNTY OF HONOLULU
ZONE 9 SECTION 1 PLAT 17
SCALE: 1 IN = 600 FT.
FOR PROPERTY ASSESSMENT PURPOSES, PARCELS MAY NOT BE LEGAL SUBDIVIDED LOTS - SUBJECT TO CHANGE
HONOULIULI, EWA, OAHU, HAWAII



Dwg No : 3318
Source : Ld. Ct. App. 1069 & T.M.B.
By : E.S.C. & H.N. Jan. 8, 1941

Por. Honouliuli, Ewa, Oahu

SUBJECT TO CHANGE

TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP

FIRST	DIVISION	
ZONE	SEC.	PLAT
9	1	18

CONTAINING PARCELS
SCALE : 1 in. = 600 ft.

CORRECTED
JAN 18 1941
JUN 14 1968
NOV 17 1958
DEC 24 1973
APR 1 7 1976
MAY 31 1985

PRINTED

910170710000

FARRINGTON HWY **STATE OF HAWAII**

Parcel Data

TMK	910170710000
Site Address	FARRINGTON HWY
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91731-8
Neighborhood Name	91731
Total Parcel Area	204.254 Acres
Zoning	U/51/50
Dedication	

Ownership

1 of 1

Owner	STATE OF HAWAII
Address 1	
Address 2	>
Address 3	
City	
State	
Country	
Zip Code	
Owner Type	Fee Owner

Data Last Updated : 8/15/2004

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Last Updated: 8/15/2004
Printed on Monday, August 16, 2004, at 4:44:17 PM EST

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910170880000

NA **STATE OF HAWAII**

Parcel Data

TMK	910170880000
Site Address	
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91731-8
Neighborhood Name	91731
Total Parcel Area	200 Acres
Zoning	U/51/50
Dedication	

Ownership

1 of 2

Owner	STATE OF HAWAII
Address 1	
Address 2	>
Address 3	
City	
State	
Country	
Zip Code	
Owner Type	Fee Owner

Data Last Updated : 8/15/2004

Disclaimer

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Printed on Monday, August 16, 2004, at 4:42:25 PM EST

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910170880000

NA **STATE OF HAWAII**

Sales

1 of 1

Sale Date	09/28/2001
Sale Amount	
Instrument #	
Instrument Type	LEASE
Instrument Description	DLNR/LAND DIV-REV PMT NO 7152 R010000790 + 2026432
Date of Recording	
Land Court Doc#	
Certificate Number	
Book/Page	/

Data Last Updated : 8/15/2004

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910170860000

NA **STATE OF HAWAII**

Parcel Data

TMK	910170860000
Site Address	
Apartment No.	
Property Class	AGRICULTURAL
Neighborhood Code	9056-5
Neighborhood Name	9056-5
Total Parcel Area	40.619 Acres
Zoning	U/51/50
Dedication	

Ownership

1 of 1

Owner	STATE OF HAWAII
Address 1	
Address 2	>
Address 3	
City	
State	
Country	
Zip Code	
Owner Type	Fee Owner

Data Last Updated : 8/15/2004

Disclaimer

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Last Updated: 8/15/2004
Printed on Wednesday, August 18, 2004, at 4:47:30 PM EST

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910160080000

FARRINGTON HWY **STATE OF HAWAII**

Parcel Data

TMK	910160080000
Site Address	FARRINGTON HWY
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91733-8
Neighborhood Name	91733
Total Parcel Area	31.915 Acres
Zoning	U/51/50
Dedication	

Ownership

1 of 2

Owner	STATE OF HAWAII
Address 1	
Address 2	>
Address 3	
City	
State	
Country	
Zip Code	
Owner Type	Fee Owner

Data Last Updated : 8/15/2004

Disclaimer

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Last Updated: 8/15/2004
Printed on Wednesday, August 18, 2004, at 4:50:18 PM EST

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910160080000

FARRINGTON HWY **STATE OF HAWAII**

Parcel Data

TMK	910160080000
Site Address	FARRINGTON HWY
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91733-8
Neighborhood Name	91733
Total Parcel Area	31.915 Acres
Zoning	U/51/50
Dedication	

Ownership

2 of 2

Owner	JEFTS,LARRY
Address 1	C/O SUGARLAND FARMS, INC
Address 2	P O BOX 27
Address 3	
City	KUNIA
State	HI
Country	
Zip Code	96759
Owner Type	Lessee

Data Last Updated : 8/15/2004

Disclaimer

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Last Updated: 8/15/2004
Printed on Wednesday, August 18, 2004, at 4:50:32 PM EST

Powered by Akanda

910180050000

FARRINGTON HWY **STATE OF HAWAII**

Parcel Data

TMK	910180050000
Site Address	FARRINGTON HWY
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91733-8
Neighborhood Name	91733
Total Parcel Area	65.999 Acres
Zoning	U/51/50
Dedication	

Ownership

1 of 2

Owner	STATE OF HAWAII
Address 1	
Address 2	>
Address 3	
City	
State	
Country	
Zip Code	
Owner Type	Fee Owner

Data Last Updated : 8/15/2004

Disclaimer

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Printed on Wednesday, August 18, 2004, at 3:26:00 PM EST

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910180050000

FARRINGTON HWY **STATE OF HAWAII**

Parcel Data

TMK	910180050000
Site Address	FARRINGTON HWY
Apartment No.	
Property Class	UNIMPROVED RESIDENTIAL
Neighborhood Code	91733-8
Neighborhood Name	91733
Total Parcel Area	65.999 Acres
Zoning	U/51/50
Dedication	

Ownership

2 of 2

Owner	JEFTS,LARRY
Address 1	C/O SUGARLAND FARMS, INC
Address 2	PO BOX 27
Address 3	
City	KUNIA
State	HI
Country	
Zip Code	96759
Owner Type	Lessee

Data Last Updated : 8/15/2004

Disclaimer

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Last Updated: 8/15/2004
Printed on Wednesday, August 18, 2004, at 3:26:10 PM EST

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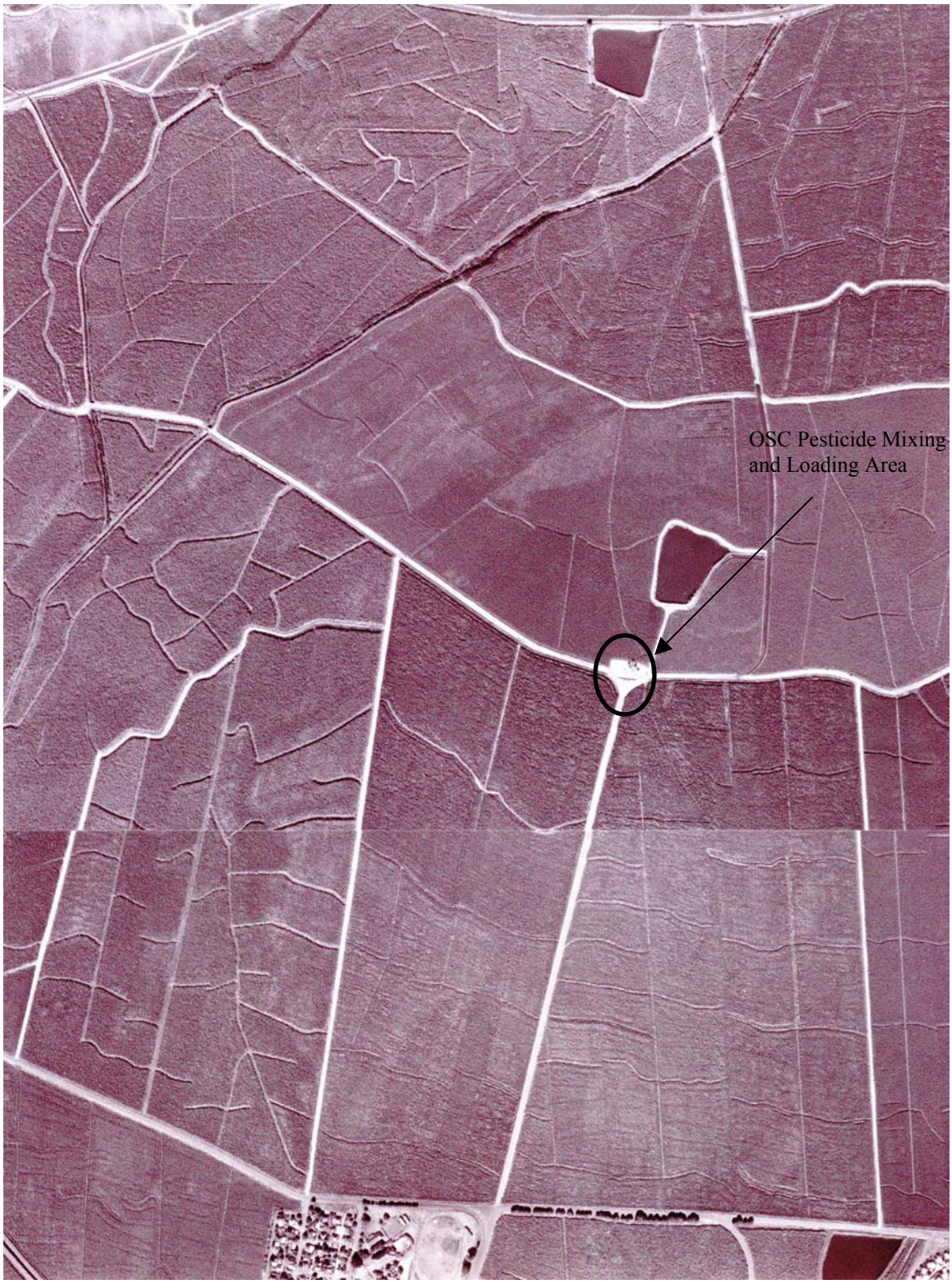
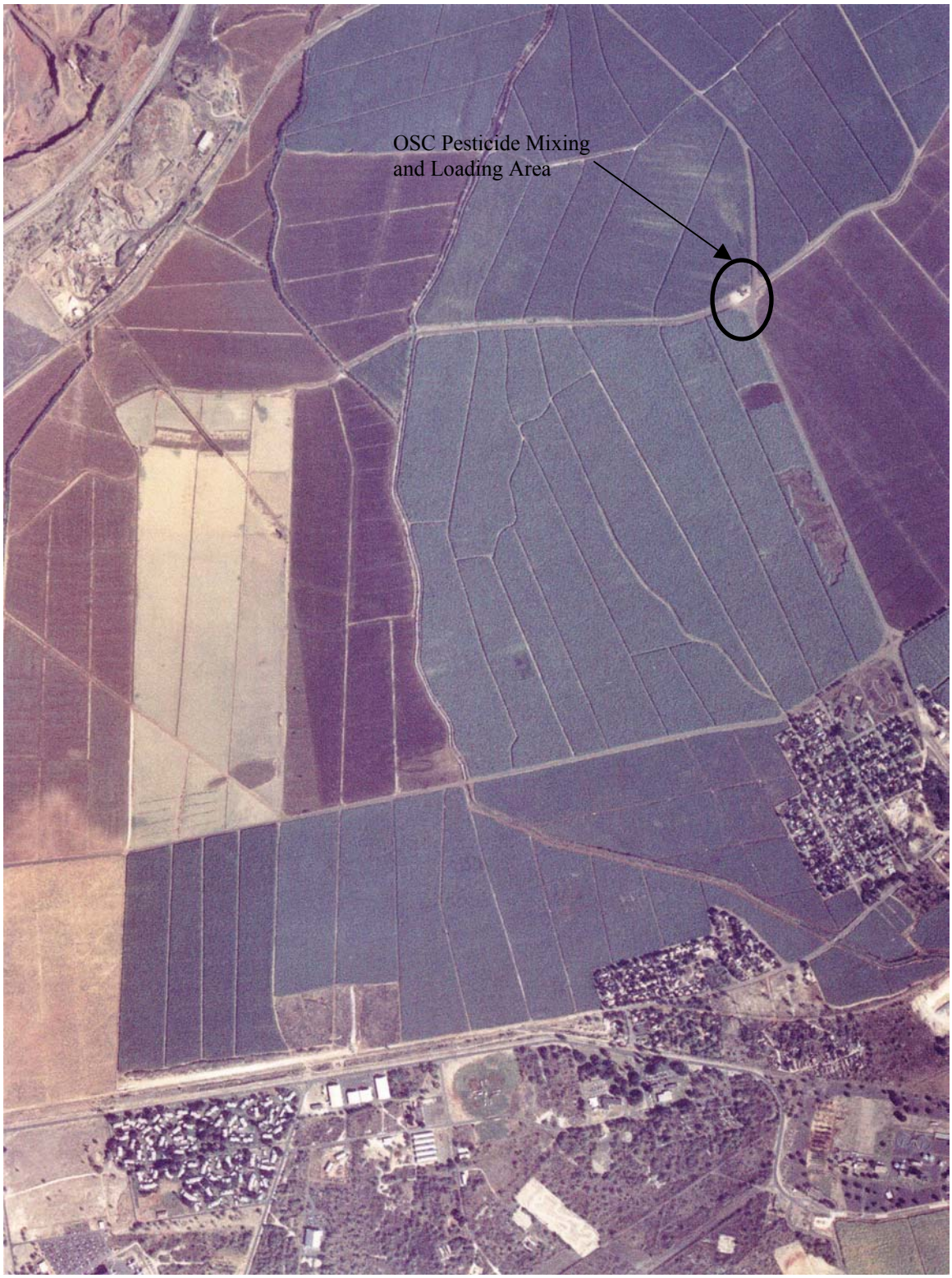
APPENDIX B

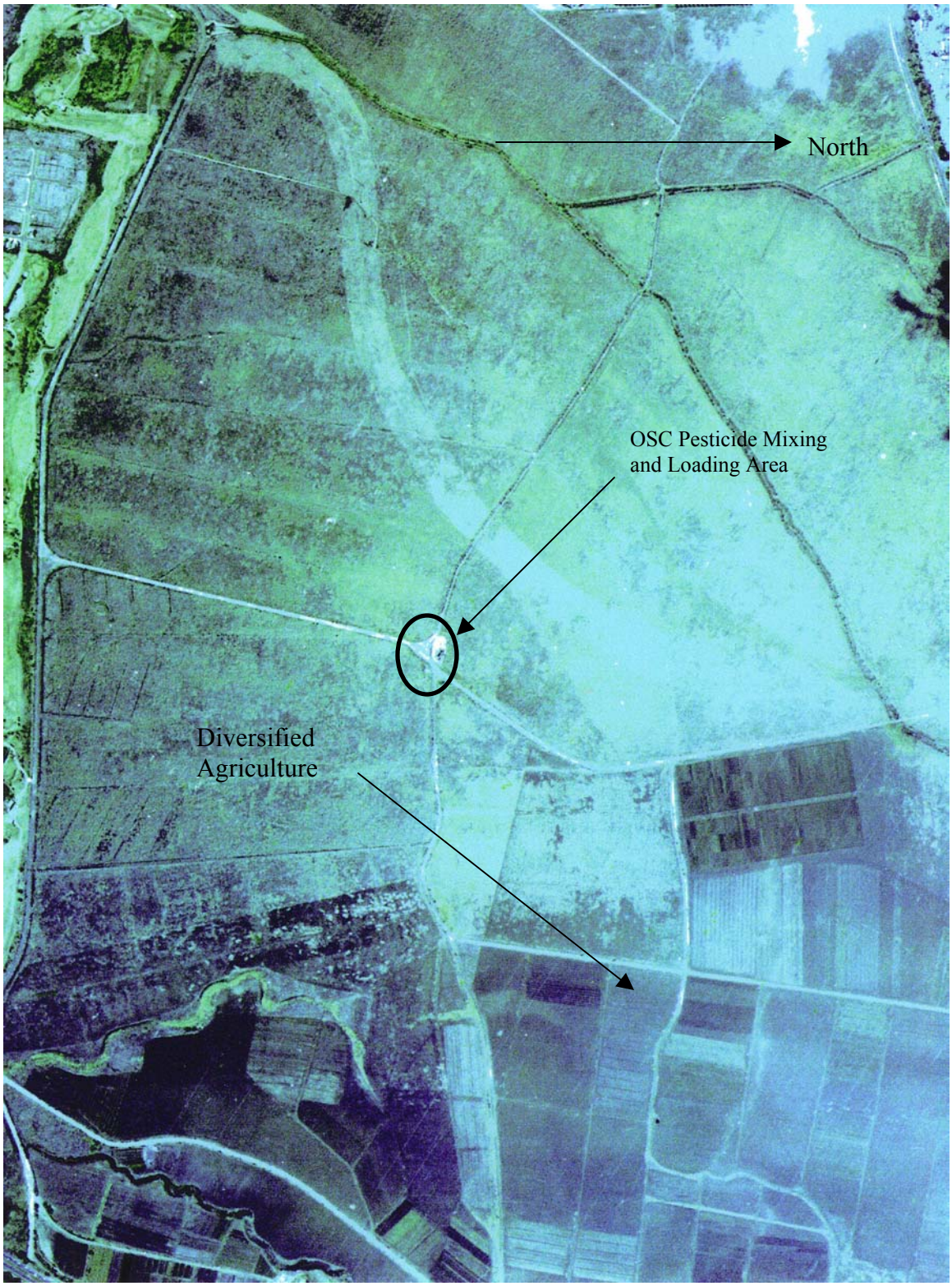
Aerial Photographs



Aerial Photo – 1970 by Air Survey Hawaii



Aerial Photo – 1990 by Air Survey Hawaii



Aerial Photo – 1998 by Air Survey Hawaii

APPENDIX C

Documents from State of Hawaii Bureau of Conveyance

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
HEER OFFICE

January 13, 1998

97-013-AB

Mr. Michael Wilson, Chairperson
Board of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Re: Dioxin Contamination at the Former Oahu Sugar Company Pesticide Mixing and Loading Site in Ewa, Oahu, Hawaii, TMK No. 9-1-17:71 (State of Hawaii, DLNR Property)

Dear Mr. Wilson:

This letter seeks your cooperation in addressing soil contamination at the former Oahu Sugar Company Pesticide Mixing and Loading Site, located in Ewa, Honolulu, Hawaii, TMK No. 9-1-17:71 (See enclosed site location map).

The U.S. Environmental Protection Agency (EPA), Region IX, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), has tasked the State of Hawaii Department of Health (DOH) to conduct a Site Inspection (SI) of the Ewa Sugar Mill/Oahu Sugar Co. (ESM/OSC) site in Ewa, Honolulu, Hawaii. A separate investigation was performed for each of four ESM/OSC subsites: the Coral Wastepit, Waipio Peninsula, the Pesticide Mixing/Loading Site, and the Fumigant Storage Area. In this letter, the term "the site" will refer to the Pesticide Mixing and Loading site. If reference is made to the entire ESM/OSC site, it will be termed "the ESM/OSC site".

The ESM/OSC site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on October 31, 1997. A preliminary assessment (PA) of the ESM/OSC site was conducted for the EPA by the DOH Hazard Evaluation and Emergency Response (HEER) Office in March 1992. The purpose of the PA was to review existing information on the site and its environs to assess the threat(s), if any, posed to public health, welfare, or the environment, and to determine if further action under CERCLA/SARA is warranted.

After reviewing the PA, the EPA decided that further investigation of the site would be necessary to more completely evaluate the site using the EPA's Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of

hazardous substances at the site. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which the EPA may conduct remedial response actions.

As part of the SI process, our office conducted surface soil sampling at the site. A total of six (6) samples were collected from various locations onsite, including one background sample collected from outside the fence surrounding the site's structures (see enclosed site layout map). The samples were analyzed by the Contract Laboratory Program Analytical Services (CLPAS) Methods for Pesticides/PCBs, Semivolatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs) and Metals. A list of Tentatively Identified Compounds (TICs) and their estimated concentrations was included with the CLPAS Semivolatiles results. Among the TICs detected in sample SS1 was a dioxin compound called dibenzo-[b,e][1,4] dioxin.

Due to the concern over possible dioxin contamination at the site, EPA's Region VII analytical laboratory reanalyzed samples SS1 and SS4 using EPA Method 1613, which specifically detects dioxin/furan compounds. SS1 was chosen based on its TIC dioxin and pentachlorophenol (PCP) detections, as dioxins are commonly found where there is PCP contamination. SS4 was chosen based on its location in a topographically low area onsite. SS4 also had a result of "not detected" for PCP; however, the reported sample quantitation limit for PCP was fairly high at 4300μg/kg (parts per billion, or ppb).

The analyses indicate that both samples contain very high levels of dioxins/furans. The 2,3,7,8 TCDD toxicity equivalents concentrations for SS1 and SS2 are 752 and 73.7 μg/kg (ppb), respectively. The respective concentrations of 2,3,7,8 tetrachlorodibenzo-p dioxin (TCDD) are 8.61 and 0.0262 ng/gm (ppb). TCDD is known to be the most toxic of the dioxin congeners. Typical soil cleanup levels for dioxin sites are approximately 1 ppb for residential sites and 20 ppb for industrial sites. Please refer to the enclosed memorandum regarding soil sample analytical results.

These extremely high levels of dioxin and furan contamination on the site are of great concern because of their high toxicity and persistence in the environment. The cancer risk estimates greatly exceed the upper bound "acceptable" risk level of 1×10^{-4}, indicating a potential for imminent and substantial health risks from exposure. A preliminary estimation of the excess cancer risk from chronic exposure to dioxins in the soil at the site, assuming industrial land use, is 3×10^{-2} (3 in one hundred or 30,000 in one million). Cancer risk estimates for a residential scenario are approximately 10 times greater.

With the serious threat posed by the dioxin contaminated soil at the former Pesticide Mixing/ Loading site, the Department of Health (DOH) is strongly recommending that the DLNR, as the property owner, take immediate action to fully secure the dioxin contaminated area to prevent any human exposure to the highly toxic contaminant. In an effort to assist in this process, the HEER Office locked the gate at the site on the morning of January 8, 1998. We have the keys to the

locks and would like to turn them over to DLNR's property manager. The DOH further recommends that warning/restriction signs be posted around the contaminated area to warn people of the hazard and keep them from entering the area.

We ask that you keep us advised about any actions you are taking to secure the contaminated area and posting of warning signs. We also ask for your participation at future meetings with Oahu Sugar Company (Amfac), James Campbell Trust Estate, the U.S. Navy and the DOH to establish what actions must be taken to address the dioxin contamination. We will be contacting you to set up a meeting time to discuss the site. If you have any questions, please contact Amy M. Baylor at 586-7576.

Sincerely,

Bryce H. Hataoka

BRYCE H. HATAOKA, Acting Manager
Hazard Evaluation and Emergency Response Office

Enclosures: Site Location Map
Site Layout Map
Memorandum: "SAL06 Soil PCDD/PCDF Samples" dated December 19, 1997

Tel/con 1/21/98 Ceil/Amy M. Baylor
Request to AMFAC
AMFAC - Sampling plan on far away from plant. — AMFAC TO DO TESTING

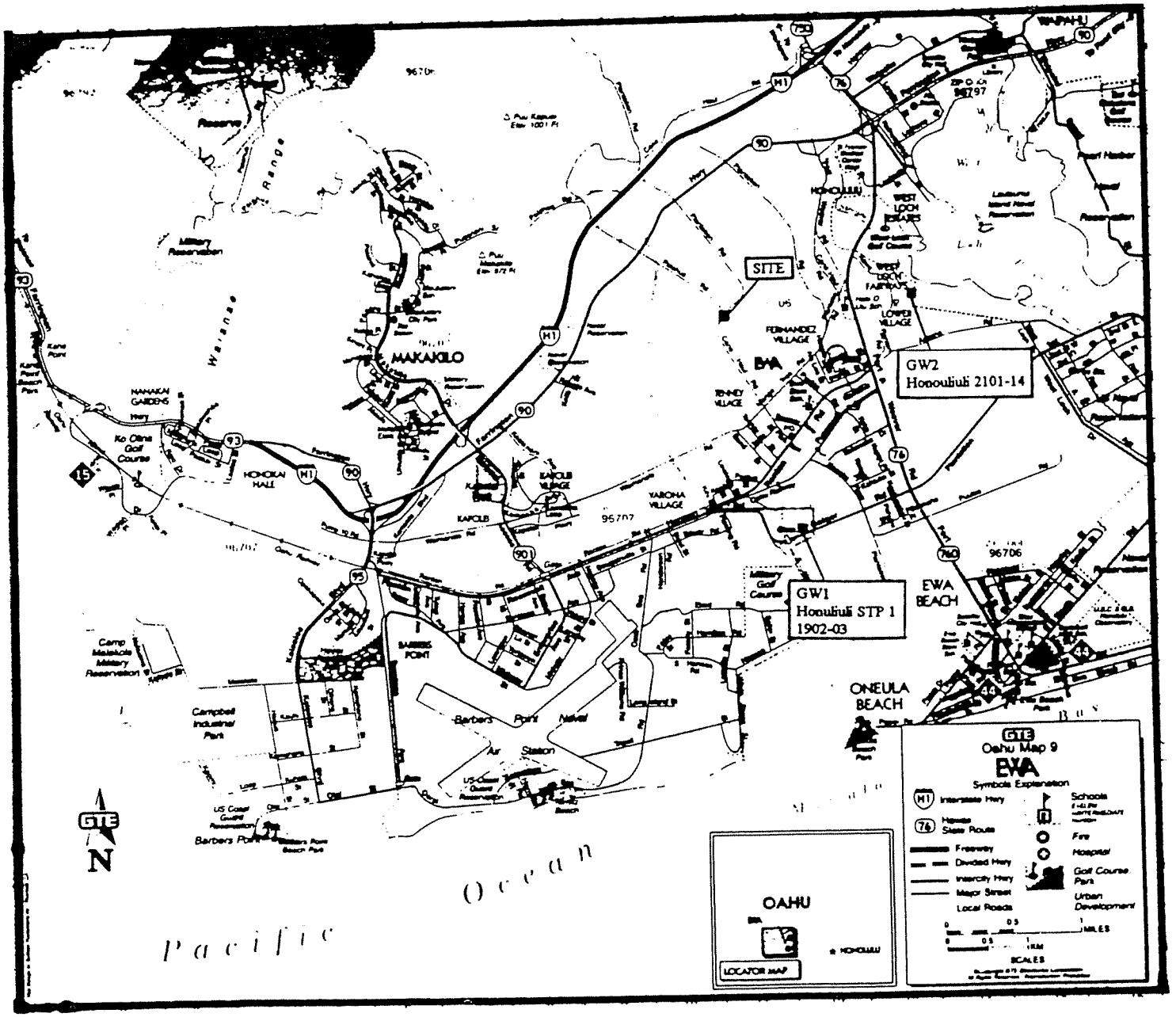


Figure 2-1
locations of pesticide mixing/loading site,
GW1 [Honouliuli STP 1 1902-03], and GW2 (background) [Honouliuli 2101-14]

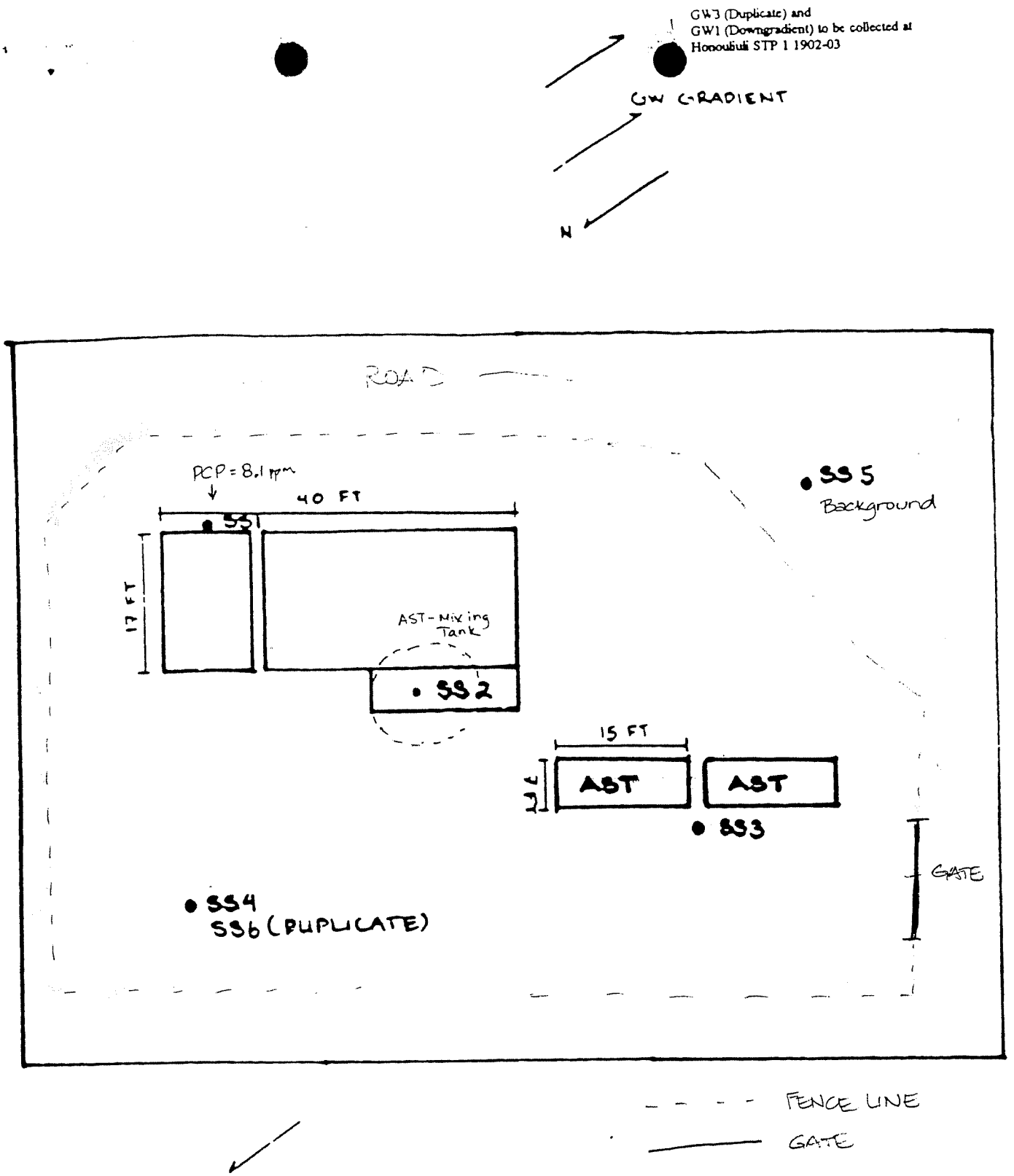


Figure 2-2 Site Layout

Deed No. S-28046 Class Final Order of Condemnation OAHU
Civil 90-1704-06
TCT No. 444,848

Grantor
TRUSTEES OF ESTATE OF JAMES CAMPBELL, Deceased and
OAHU SUGAR COMPANY, LIMITED

Grantee
STATE OF HAWAII

Date of Instrument	Book	Page	Area	Consideration
8/22/94 (S/J)	Unrecorded		1,100 Acres	$35,103,636.02
8/22/94 (F/O)	Document No. 94-155203 and 2181717			

Description

Acquisition of Lot 8861 (1,099.998 ac), Map 671, Land Court Appln. 1069 (TCT No. 443,208 to Trustees of Estate of James Campbell, Deceased) and Remnant D (.002 acre), being land also known as "Golden Triangle Property," situate at Honouliuli, Ewa, Oahu for preservation of agricultural and development of housing, infrastructure, and public facilities
Tax Map Key 9-1-16:Por. 25 and 9-1-17:Por.4

26344
EXHIBIT D

rg

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

CC: Dean
Janet
Sonia F

RECEIVED
00 NOV 22 AM : 56

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

In reply, please refer to:
File:

00-420-BH

November 21, 2000

RECEIVED
2000 NOV 28 A 11: 15
LAND DIVISION

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

The Honorable Timothy E. Johns, Chair
Department of Land and Natural Resources
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

Dear Mr. Johns:

Subject: Ewa Sugar/Oahu Sugar Company Pesticide Mixing and Loading Site

The Department of Health (DOH), Hazard Evaluation and Emergency Response (HEER) Office has reviewed the Ewa Sugar/Oahu Sugar pesticide mixing and loading site ("site") according to criteria listed in the Hawaii Administrative Rules Title 11 Chapter 451 Subchapter 3 Section 9, as well as for health risk concerns and emergency response considerations. The site is owned by the State and managed by DLNR (see attached map).

The DOH has reviewed available information regarding the site, and has determined its priority. This determination is based on a review of the following documents:

1. Ewa Sugar Mill/Oahu Sugar Company - Preliminary Assessment, May 1993.

2. Ewa Sugar Mill/Oahu Sugar Company Pesticide Mixing and Loading Site - Site Inspection, July 2000.

The prioritization process identifies sites as high, medium or low. Secondly, it may be determined that No Further Action (NFA) be taken relative to the site regarding reported release(s). The process generally uses available data and assesses the degree to which the release(s) poses a threat or potential threat to human health or environmental receptors. Based on our site screening procedures, this site has been identified as HIGH priority. Our decision is based on the following:

1. *The site is contaminated with dioxins at elevated levels (attached tables). Most of the contamination is believed to be contained within the fenced area. However, the contamination extends into an adjoining field (to the north).*

2. *The area across the dirt road from the site is currently being used for the cultivation of vegetables, and field workers are in close proximity to the site (attached map). The field to the north of the site is currently being used for the cultivation of corn, and tests indicate that some levels of dioxin contamination have been found there.*

3. *Dioxins bind to clay particles in soil and may be transported by wind and/or rain to other locations. The soils on the site are not well contained or controlled. Other contaminants include: ametryn, glyphosphate, diuron, atrazine, simazine, terbacil, 2,4-D, dalapon, picloram, 4,4'DDD, 4,4'DDE, 4,4'DDT, delta-BHC, dieldrin, endrin aldehyde, gamma-Clordane, 2,3,4,6-tetrachlorophenol, pentachlorophenol, bis(2-ethylhexyl)phthalate, 1,2-dichlorobenzene, 2,4-dichlorophenol, fluoranthene, and pyrene (attached tables).*

Although the department has specific concerns mentioned above, there might be areas of the site that extend beyond the fence-line requiring further investigation and eventual remediation. Any response actions taken at the site should address all contaminants and potential routes of exposure.

The DOH intends to provide oversight on all HIGH priority sites. In addition, a Remedial Project Manager (RPM) or On-Scene Coordinator (OSC) will be assigned to this site. Until the department has made the assignment, we request that you immediately address the problem posed by the uncontrolled dust at the site with appropriate measures to mitigate the potential migration of dust and soil from the site. We also believe that the adjacent field north of the site should be given a buffer zone to prevent exposure to workers there. On October 4, 2000, HEER Office staff spoke with Mr. Cecil Santos of your department concerning the need to characterize the nature and extent of contamination, and the need to address a dust cover as an interim measure. Mr. Santos asked about cleanup requirements and costs involved. However, the HEER Office cannot provide any estimates until a complete site characterization is completed. The U.S. Environmental Protection Agency (EPA) is interested in this site and its emergency response group may be willing to assist with an interim measure. Please be aware that, should the EPA or DOH use response funding on the site, cost recovery shall follow.

Any long-term action taken to remediate contamination at this site should be done according to the "Technical Guidance Manual for the Implementation of The Hawaii State Contingency Plan" (TGM). This manual provides step-by-step procedural and technical guidance to potentially responsible parties (PRPs) and to HEER Office personnel to address releases of hazardous substances in Hawaii. The TGM is available for photocopying at the HEER Office, or it can be downloaded from our website. The HEER Office web address is:

http://www.pdc.org/pdc/WEB_PAGE/heer/heertbl2.htm or
http://www.state.hi.us/health/eh/heer

EXHIBIT D

The website also includes forms for record requests along with instructions. This form may be used to request review of the case file for Ewa Sugar Mill/Oahu Sugar Company.

We reserve the right to modify our prioritization should site conditions warrant. We appreciate your cooperation in this matter. Should you have any questions, please contact Mr. Keith Kawaoka, Manager, DOH, HEER Office at 586-4249.

Sincerely,

BRUCE S. ANDERSON, Ph.D., M.P.H.
Director of Health

Attachments

c: Deputy Director
Environmental Health Administration

EXHIBIT D

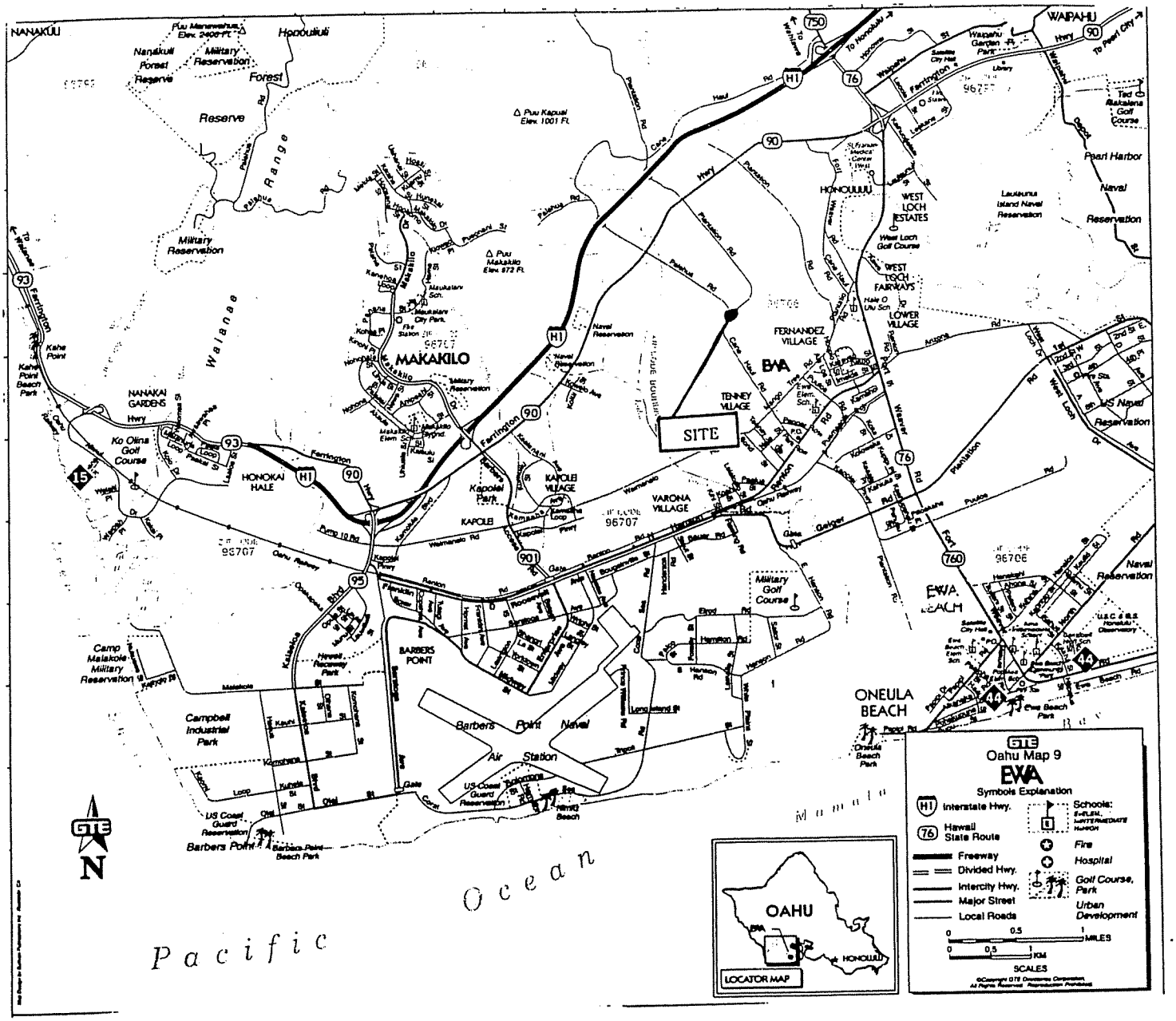

SITE
Oahu Map 9
EWA
Symbols Explanation
Interstate Hwy.
Hawaii State Route
Freeway
Divided Hwy.
Intercity Hwy.
Major Street
Local Roads
Schools:
Fire
Hospital
Golf Course, Park
Urban Development
MILES
KM
SCALES
OAHU
LOCATOR MAP
HONOLULU
MAKAKILO
HONOULIULI
WAIPAHU
EWA BEACH
ONEULA BEACH
BARBERS POINT
KAPOLEI
VARONA VILLAGE
TENNEY VILLAGE
FERNANDEZ VILLAGE
WEST LOCH ESTATES
WEST LOCH FAIRWAYS
LOWER VILLAGE
HONOKAI HALE
NANAKAI GARDENS
Barbers Point Naval Air Station
Campbell Industrial Park
Camp Malakole Military Reservation
Military Reservation
Forest Reserve
Waianae Range
Pearl Harbor Naval Reservation
Pacific Ocean
N

Table 3-1
Surface Soil Sample Analytical Results
May 1997/September 1999 DOH Sampling

Sample Location	S1	S2	S3	S4	S5 (bg)	S6 (S4 dup)
CLPAS Metals (mg/kg)						
Arsenic	**29.9**	**27.2**	**51.7**	13.9	11.5	13.0
Chromium	127	84.1	69.0	67.8	74.3	65.0
Lead	153	200	230	43.1	8.6	43.9
Mercury	0.64	0.82	0.30	ND <0.06	ND <0.05	ND <0.05
Zinc	1740	1900	1120	241	107	233
CLPAS SVOCs (µg/kg)						
PCP	**8,100** L,J,BI	1,400 L,J,B	1,100 L,J,B	ND <4,300 J,IR	ND <370 J,I	ND <4,300 R
Di-n-butylphthalate	ND <8,800	ND <9,700	ND <9,500	ND <1,700 R	43 L,J,BQ	ND <1,700 R
Bis (2-ethylhexyl) phthalate	4,000 L,J,BQ	ND <9,700 J	2,600 J	270 J	120 J	300 J
CLPAS VOCs (µg/kg)						
Chloromethane	ND <11 J,J	2 L,J,B	ND <10	ND <10	ND < 11	ND <10
1,1-Dichloroethene	ND <11 J,J	ND <12	ND <10	3 L,J,B	ND < 11	4 L,J,BC
Toluene	ND <11 R,A	ND <12	ND <10	ND <10 J,J	3 L,J,B	3 L,J,BJ
CLPAS Pesticides/PCBs (µg/kg)						
4,4'-DDE	110 NJ,M	ND <38 S	ND <3.4 J,L	3.7 NJ,LM	ND <3.7 J,L	4.6 NJ,LM
4,4'-DDD	ND <38 S	57 NJ,M	7.3 NJ,LM	ND <3.4 J,L	ND <3.7 J,L	5.8 J,L
4,4'-DDT	68 NJ,MO	300	39 J,L	5.1 NJ,LM	5.6 NJ,LN	6.9 NJ,LMN
RAP Chlorinated Herbicides (µg/kg)						
2,4-D	ND <210 D	620 J,D	ND <210 D	380 NJ,BD	ND <210 D	410 NJ,ACD
Dalapon	ND <2,100 D	ND <2,300 D	ND <2,100 D	ND <2,000 D	ND <2,100 D	ND <2,000 D
PCP	**13,000**	980	**8,900** J,A	550	ND <42	460 J,A
Region VII PCDD/PCDF (µg/kg)						
TEQ	**752** J	NA	NA	**73.7** J	NA	NA

Benchmark U.S. EPA Region IX Preliminary Remediation Goals (PRGs)
ND Not detected above the reported CRDL.
NA Not analyzed.
R Data rejected via validation process.
Full definitions for validation qualifiers are found with the associated data in Appendix G.
Bold values indicate that they exceed the respective benchmark.

EXHIBIT D

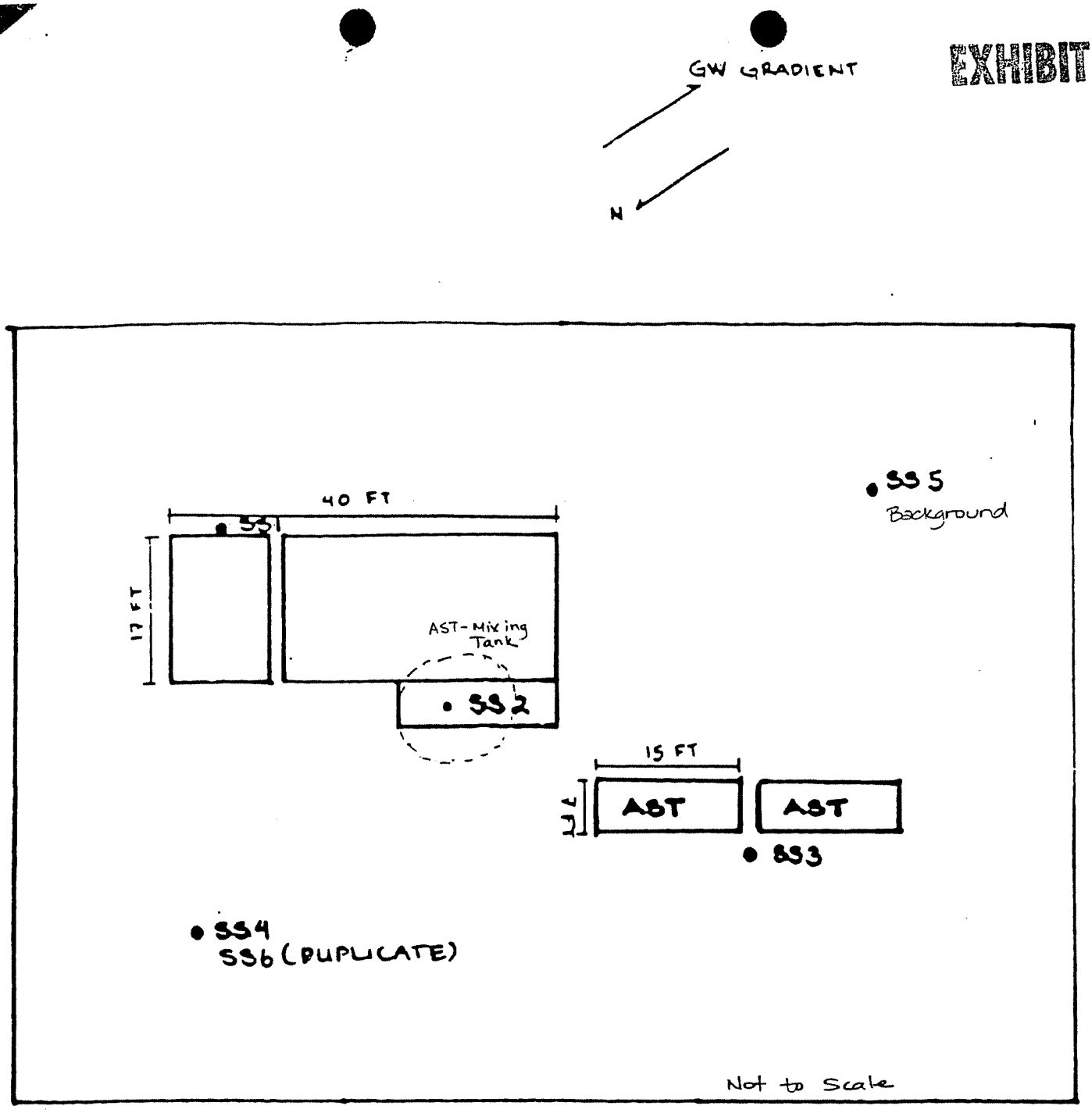


Figure 3-1
Soil Sample Locations: SS1-SS5
DOH SI Sampling: May 1997 & September 1999

Table 3-2
Surface Soil Sample Analytical Results
February 2000 EPA Sampling

Sample Location	BG	SB	S1	S-7	SD-1,2,3	SF-1	SF-2	SF-3	SF-4	SM-1	SM-2	SM-3	SP-1	SP-2	SP-3
PCDD/PCDF (ug/kg)															
PCDD/PCDF TEQ	0.065 E	**63.1 E**	**333.6 E**	**2.3 E**	**1.4 E**	0.064 EM	0.089 E	0.084 EM	0.07 EM	**94.3 E**	**44.4 E**	**98.0 E**	**4.8 E**	**10.9 E**	**8.5 E**
HERBICIDES (ug/kg)															
Ametryne**	ND	3600 JE	120000 E	ND	ND	ND	ND	ND	ND	2100 J	8000 E	13000 E	ND	ND	ND
Glyphosate	ND	34000	4610 E	ND	ND	ND	ND	ND	ND	2430 J	5930 E	21800 E	2630 JE	2520 JE	ND
Diuron	ND	3020	16500 E	78.8 J	61.3 J	76.5 J	47.8 J	50.4 J	23.5 J	683 E	3030	10100 E	188 E	374 E	200
Atrazine	ND	*6900 U*	**86000** E	*6700 U*	*6900 U*	ND	ND	ND	ND	*3400 U*	*7600 U*	*3000 JE*	*7100 U*	*3800 U*	*7300 U*
Simazine	ND	*6900 U*	*8000 U*	*6700 U*	*6900 U*	ND	ND	ND	ND	ND	*7600 U*	*7100 U*	*7100 U*	ND	*7300 U*
Terbacil	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	940 JE	ND	ND	ND	ND
Trifluralin	ND	ND	**190000 E**	770 E	ND	ND	ND	ND	ND	ND	1900 JE	ND	ND	ND	ND
Propiconazole	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-D	47	640 E	1700 E	24	26	ND	120	61	34	ND	620 E	320 E	180 E	100 E	57
Dalapon	ND	ND	ND	ND	ND	ND, R	ND	ND	ND	ND	37 E	ND	ND	ND	ND
Picloram	ND	ND	ND	ND	ND	ND	ND	ND	ND	44 E	ND	ND	ND	ND	ND
PESTICIDES/PCBs (ug/kg)															
4,4'-DDD	ND	34	ND	ND	ND	ND	ND	ND	ND	ND	ND, E	130 E	ND	ND	ND
4,4'-DDE	ND	40 E	ND	ND	ND	ND	ND	ND	ND	14 JE	43 E	81	ND	ND	ND
4,4'-DDT	ND	67 E	ND	ND	ND	ND	ND	ND	ND	ND, E	220 E	310 E	35 JE	41 E	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	84 E	36 E	ND	ND	ND
Gamma-chlordane	ND	6.8 JE	ND	ND	ND	ND	ND	ND	ND	ND	9.5 JE	ND	3.2 JE	ND	3.6 JE
BNAs (ug/kg)															
2,3,4,6-tetrachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	570	360	ND	ND	ND	ND
Pentachlorophenol	ND	1600 J	**15000 E**	*8500 U*	*8700 U*	ND	ND	ND	ND	**17000 E**	7500	1700 J	*3,600 U*	*3,900 U*	*3,700 U*
Bis(2-ethylhexyl)phthalate	ND	4000	1100	ND	ND	ND	ND	ND	940	650 J	5500	2000	ND	ND	ND
1,2-dichlorobenzene	ND	ND	330 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dichlorophenol	ND	ND	560 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	23 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	260 J	ND	2700	ND	ND	ND
METALS (mg/kg)															
Arsenic	14	16	**39**	18	18	11	9.6	8.9	**43**	**50**	**160**	**30**	12	16	16
Chromium	120	180	170	77	95	93	94	100	84	62	160	100	62	75	91
Lead	7	270	300	16	14	6.4	7.4	6.9	6.1	210	240	350	35	33	39
Zinc	120	3,500	2,400	260	140	120	130	120	130	720	2,000	3,000	130	170	270

U or ND Not detected above a given minimum detection limit (MDL). MDLs are provided in Appendix G (complete analytical results), and are well below the benchmark levels (EPA Region IX PRGs).
Those values in *Italics* are MDLs above the appropriate benchmark level.
E Estimated
R Rejected
BNAs Base Neutral Acids (i.e. Semivolatile Organic Compounds)
Bold values indicate that they exceed the respective benchmark.

EXHIBIT 3-1

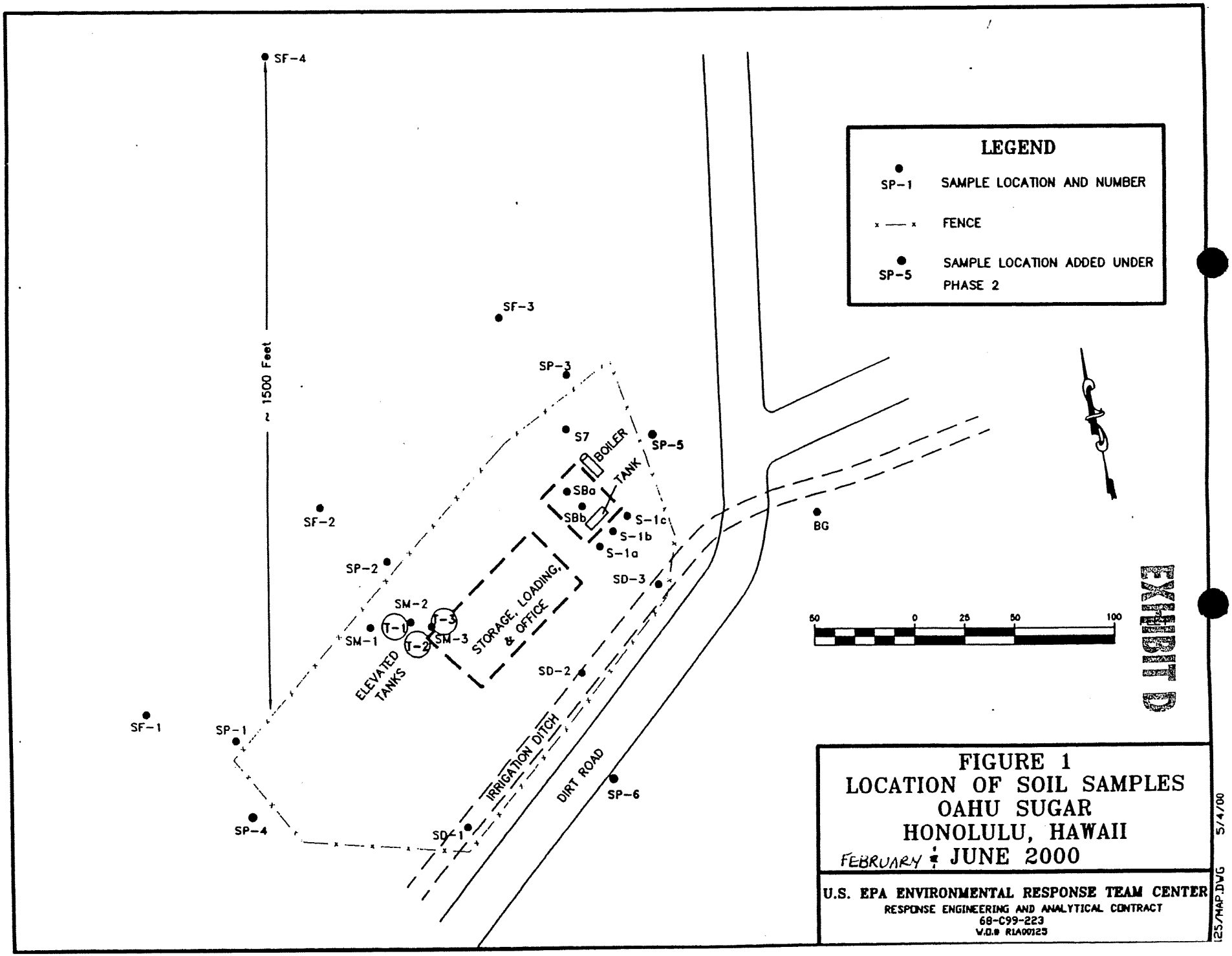


FIGURE 1
LOCATION OF SOIL SAMPLES
OAHU SUGAR
HONOLULU, HAWAII
FEBRUARY - JUNE 2000

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-C99-223
W.O.# R1A00125

125/MAP.DWG 5/4/00

EXHIBIT D

Table 3-3 Soil Benchmark Levels for COPCs		
COPC	Soil Benchmark Levels (mg/kg)	(ug/kg)
PCDD/PCDF TEQ[a]	0.001	1
Ametryne	550	550,000
Glyphosate	6100	6,100,000
Diuron	120	120,000
Atrazine	2.2	2,200
Simazine	4.1	4,100
Terbacil	790	790,000
Trifluralin	63	63,000
Propiconazole	790	790,000
2,4-D	690	690,000
Dalapon	1,800	1,800,000
Picloram	4,300	4,300,000
DDD	2.4	2,400
DDE	1.7	1,700
DDT	1.7	1,700
Endrin aldehyde	18	18,000
Gamma-Chlordane	1.6	1,600
Pentachlorophenol (PCP)	3.0	3,000
Di-n-butylphthalate	6,100	6,100,000
Bis(2-ethylhexyl)phthalate	35	35,000
Chloromethane	1.2	1,200
1,1-Dichloroethene	0.054	54
Toluene[b]	520	520,000
1,2-dichlorobenzene	370	370,000
2,4-dichorophenol	180	180,000
Fluoranthene[b]	2,300	2,300,000
Pyrene	NL	NL
Arsenic	22	NA
Chromium	210	NA
Lead	400	NA
Mercury	23	NA
Zinc	23,000	NA

a A Benchmark Level of 1 ppb is provided in the EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9200.4-26.

b The DOH Tier 1 Action Level for Toluene is 34 mg/kg (34,000 ug/kg); the DOH Tier 1 Action Level for Fluoranthene is 11 mg/kg, or 11,000 ug/kg.

NL Not listed in the PRGs.

NA Not applicable; sample results are provided in mg/kg.

State of Hawaii
Department of Land and Natural Resources
Division of Forestry and Wildlife
Oahu Branch
Natural Area Reserve System
2135 Makiki Heights Drive • Honolulu, HI • 96822
Phone: 808.973.9783 • Fax: 808.973.9781

Memo

TO: Charlene Unoki

FROM: Brent Liesemeyer, NARS Manager

CC: Vicky Caraway, State Botanist

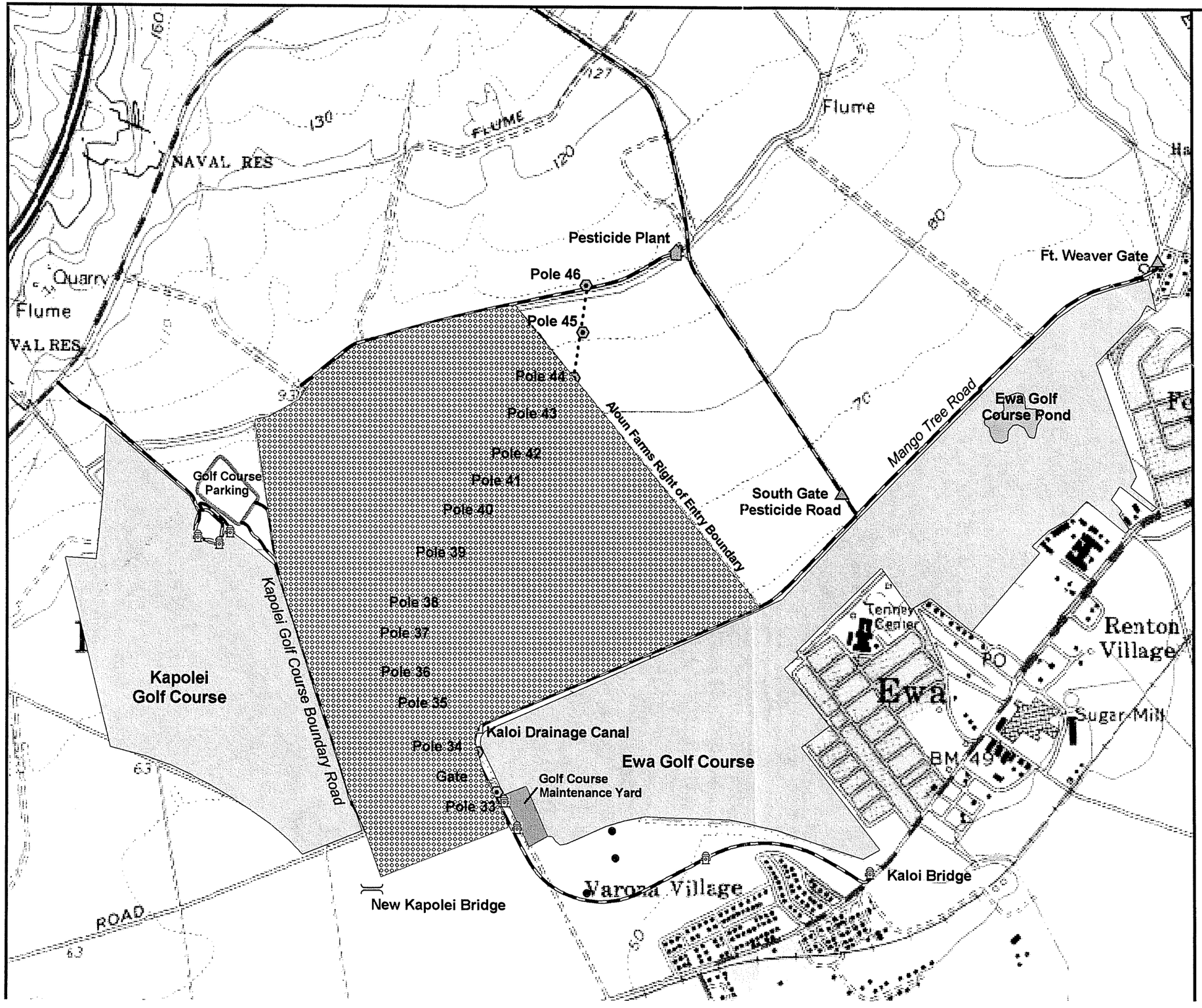
Pat Costales, Branch Manager

DATE: 1/28/2002

RE: Aloun Farms Request For Additional Acreage In East Kapolei

Aloha Charlene,

I consulted with Vicky Caraway, State Botanist with the Division of Forestry and Wildlife, about Mr. Mike Sou's request to farm additional acreage in East Kapolei. We agreed that the prudent approach to this request is to exclude agriculture activities from the area bounded by the Pesticide Plant to the north and the current exclusion zone line to the east. This area is indicated on the attached map and encompasses approximately 366 acres. I know that during our site visit of 17 January 2002 we indicated that we it might be possible for Mr. Sou to farm more area than we are currently recommending. However, we feel that there is a possibility of finding additional *Abutilon menziesii* plants in the area and a need for a buffer between the agricultural activities and the known plants. Therefore, our recommendation is to exclude agricultural activities from this 366-acre area to protect this population of the endangered plant *Abutilon menziesii*. If you have any questions please contact me at 973-9783. Mahalo!!!



East Kapolei *Abutilon menziesii* Population

- *Abutilon menziesii* Location
- Power Pole
- Gate
- Fire Hydrant
- Drainage Canal
- Pesticide Plant
- Bridge
- Powerline
- Right of Entry Boundary
- Road
- Coral Road
- Pond (Approximate)
- Golf Course (Approximate)
- Golf Course Maintenance Yard (App
- Aloun Farms Exclusion Area
  Approximate Acres = 366

Note:
Point & Line data were surveyed using a Trimble Pathfinder ProXR GPS. All GPS data was realtir differentially corrected and has an accuracy of +/- two meter. Background map is the USGS 7.5 Minute Ewa Quadrangle.

N
W E
S

Scale 1:12,000

100 0 100 300 500 Meters

APPENDIX D

EDR Inquiry Report:
East Kapolei Brownfield

The EDR Radius Map
with GeoCheck®

East Kapolei Brownfield
East Kapolei Brownfield
Kapolei, HI 96706

Inquiry Number: 01253664.1r

August 19, 2004

EDR™ Environmental
Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-MER

TABLE OF CONTENTS

SECTION	PAGE
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Detail Map	3
Map Findings Summary	4
Map Findings	6
Orphan Summary	16
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-8
Physical Setting Source Map Findings	A-9
Physical Setting Source Records Searched	A-30

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

EAST KAPOLEI BROWNFIELD
KAPOLEI, HI 96706

COORDINATES

Latitude (North):	21.349400 - 21° 20' 57.8"
Longitude (West):	158.044100 - 158° 2' 38.8"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	599117.5
UTM Y (Meters):	2360979.5
Elevation:	80 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	21158-C1 EWA, HI
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL	National Priority List
Proposed NPL	Proposed National Priority List Sites
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CORRACTS	Corrective Action Report
RCRIS-TSD	Resource Conservation and Recovery Information System
RCRIS-LQG	Resource Conservation and Recovery Information System
RCRIS-SQG	Resource Conservation and Recovery Information System
ERNS	Emergency Response Notification System

STATE ASTM STANDARD

SWF/LF	Permitted Landfills in the State of Hawaii

EXECUTIVE SUMMARY

UST ..... Underground Storage Tank Database
VCP ..... Voluntary Response Program Sites

FEDERAL ASTM SUPPLEMENTAL

CONSENT ..... Superfund (CERCLA) Consent Decrees
ROD ..... Records Of Decision
Delisted NPL ..... National Priority List Deletions
FINDS ..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS ..... Hazardous Materials Information Reporting System
MLTS ..... Material Licensing Tracking System
MINES ..... Mines Master Index File
NPL Liens ..... Federal Superfund Liens
PADS ..... PCB Activity Database System
UMTRA ..... Uranium Mill Tailings Sites
FUDS ..... Formerly Used Defense Sites
INDIAN RESERV ..... Indian Reservations
US BROWNFIELDS ..... A Listing of Brownfields Sites
RAATS ..... RCRA Administrative Action Tracking System
TRIS ..... Toxic Chemical Release Inventory System
TSCA ..... Toxic Substances Control Act
SSTS ..... Section 7 Tracking Systems
FTTS INSP ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

SPILLS ..... Release Notifications

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas ..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS ..... A Listing of Brownfields Sites
BROWNFIELDS ..... Brownfields Sites
VCP ..... Voluntary Response Program Sites

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

FEDERAL ASTM STANDARD

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 05/17/2004 has revealed that there is 1 CERCLIS site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
EWA SUGAR MILL/OAHU SUGAR CO.	***RENTON ROAD***	***1/2 - 1 SSE***	***2***	***6***

STATE ASTM STANDARD

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

A review of the SHWS list, as provided by EDR, and dated 07/12/2001 has revealed that there are 2 SHWS sites within approximately 1.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
EWA SUGAR MILL/OAHU SUGAR CO.	***RENTON ROAD***	***1/2 - 1 SSE***	***2***	***6***
EWA REPAIR SHOP/TESORO (FORT	91-1669 FORT WEAVER ROA	1 - 2 E	3	14

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Health's Active Leaking Underground Storage Tank Log Listing.

A review of the LUST list, as provided by EDR, and dated 05/01/2004 has revealed that there is 1 LUST site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
EWA ELEMENTARY SCHOOL	91-1280 RENTON RD	1/2 - 1 SE	1	6

FEDERAL ASTM SUPPLEMENTAL

Federal Lands: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 10/01/2003 has revealed that there is 1 DOD

site within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BARBERS POINT NAVAL AIR STATIO		1 - 2 S	0	6

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

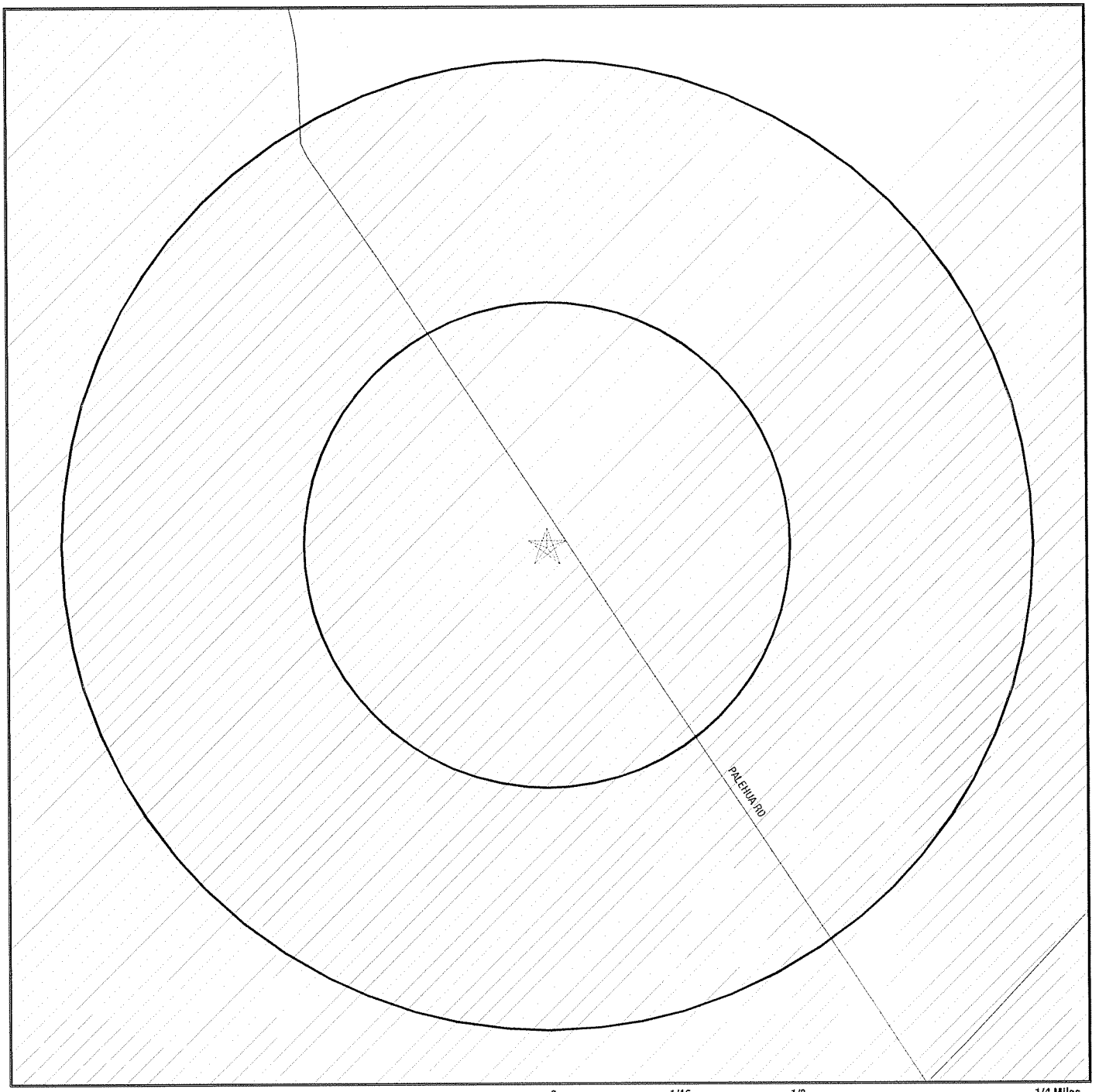
Site Name	Database(s)
ADVANCED TECHNOLOGY INCINERATION	RCRIS-SQG, FINDS, RCRIS-TSD
UNITEK ENVIRONMENTAL SERVICES INC	PADS, RCRIS-LQG, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
PEPPER INDUSTRIES	RCRIS-SQG, FINDS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
HAWAIIAN INDEPENDENT REFINERY INC	FINDS, RCRIS-LQG, TRIS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
CHEVRON USA HAWAIIAN REF	SHWS, FINDS, RCRIS-LQG, TRIS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
HAWAIIAN WESTERN STEEL DUMP	RCRIS-SQG, SHWS, FINDS, RCRIS-TSD, CORRACTS, CERC-NFRAP
PUU PALAILAI LANDFILL	SHWS
HAWAIIAN ELECTRIC CO, INC. KAHE GE	SHWS, SPILLS
HAWAIIAN ELECTRIC CO, INC. KAHE GE	SHWS
CORAL WASTEPIT	SHWS
BARBERS POINT LANDFILL	SHWS
HAWAII RACEWAY PARK	SHWS
JACKSON CONSTRUCTION LANDFILL	CERCLIS, SHWS, FINDS
BREWER CHEMICAL CORPORATION	SHWS
BREWER CHEM CORP (BREWER ENVIRONM	SHWS
CHEMWOOD TREATMENT CO, INC.	SHWS
HANUA STREET FUGITIVE OIL	SHWS, SPILLS
TEXACO MALAKOLE STREET PIPELINE EX	SHWS, SPILLS
DEEP DRAFT HARBOR PIER 5 CRUDE OIL	SHWS
SINGLE BUOY MOORING BARBERS POINT	SHWS
HAWAIIAN SUGAR PLANTER'S ASSOCIATI	SHWS
EWA SUGAR MILL/OAHU SUGAR CO. - CO	CERCLIS, FINDS
EWA SUGAR/OAHU SUGAR CO. - PESTICI	CERCLIS, FINDS
HAWAII METAL RECYCLING CO	CERCLIS, RCRIS-SQG, FINDS
PACIFIC CONCRETE & ROCK LDFL	CERC-NFRAP
WAIMANALO GULCH LANDFILL, EWA	SWF/LF
EWA VILLAGE PROJECT	LUST
KSSK-FM TRANSMITTER SITE	UST
AERONAUTICAL RADIO, INC	UST
PALEHUA OBSERVATORY	UST
KAPOLEI PIPELINE FUEL SPILL	FINDS
EWA BY GENTRY - EAST WASTEWATER	FINDS
EAST MOORING BOUY SHEEN SIGHTING	SPILLS

OVERVIEW MAP - 01253664.1r - AMEC Earth and Environmental

- ☆ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands

TARGET PROPERTY:	East Kapolei Brownfield	CUSTOMER:	AMEC Earth and Environmental
ADDRESS:	East Kapolei Brownfield	CONTACT:	Brandis Ueyama
CITY/STATE/ZIP:	Kapolei HI 96706	INQUIRY #:	01253664.1r
LAT/LONG:	21.3494 / 158.0441	DATE:	August 19, 2004 7:54 pm

DETAIL MAP - 01253664.1r - AMEC Earth and Environmental



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

N

TARGET PROPERTY:	East Kapolei Brownfield	CUSTOMER:	AMEC Earth and Environmental
ADDRESS:	East Kapolei Brownfield	CONTACT:	Brandis Ueyama
CITY/STATE/ZIP:	Kapolei HI 96706	INQUIRY #:	01253664.1r
LAT/LONG:	21.3494 / 158.0441	DATE:	August 19, 2004 7:54 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.500	0	0	0	0	0	0
Proposed NPL		1.500	0	0	0	0	0	0
CERCLIS		1.000	0	0	0	1	NR	1
CERC-NFRAP		0.750	0	0	0	0	NR	0
CORRACTS		1.500	0	0	0	0	0	0
RCRIS-TSD		1.000	0	0	0	0	NR	0
RCRIS Lg. Quan. Gen.		0.750	0	0	0	0	NR	0
RCRIS Sm. Quan. Gen.		0.750	0	0	0	0	NR	0
ERNS		0.500	0	0	0	NR	NR	0
STATE ASTM STANDARD								
SHWS		1.500	0	0	0	1	1	2
State Landfill		1.000	0	0	0	0	NR	0
LUST		1.000	0	0	0	1	NR	1
UST		0.750	0	0	0	0	NR	0
VCP		1.000	0	0	0	0	NR	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	0	0
Delisted NPL		1.500	0	0	0	0	0	0
FINDS		0.500	0	0	0	NR	NR	0
HMIRS		0.500	0	0	0	NR	NR	0
MLTS		0.500	0	0	0	NR	NR	0
MINES		0.750	0	0	0	0	NR	0
NPL Liens		0.500	0	0	0	NR	NR	0
PADS		0.500	0	0	0	NR	NR	0
UMTRA		1.000	0	0	0	0	NR	0
FUDS		1.500	0	0	0	0	0	0
INDIAN RESERV		1.500	0	0	0	0	0	0
US BROWNFIELDS		1.000	0	0	0	0	NR	0
DOD		1.500	0	0	0	0	1	1
RAATS		0.500	0	0	0	NR	NR	0
TRIS		0.500	0	0	0	NR	NR	0
TSCA		0.500	0	0	0	NR	NR	0
SSTS		0.500	0	0	0	NR	NR	0
FTTS		0.500	0	0	0	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
SPILLS		0.500	0	0	0	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.500	0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
BROWNFIELDS DATABASES								
US BROWNFIELDS		1.000	0	0	0	0	NR	0
BROWNFIELDS		1.000	0	0	0	0	NR	0
VCP		1.000	0	0	0	0	NR	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

DOD **BARBERS POINT NAVAL AIR STATION (CLOSED)** **DOD** **CDOD048409**
Region South **N/A**
HONOLULU (County), HI
> 1
6389 ft.

FEDERAL LANDS:

Feature 1:	Navy DOD
Feature 2:	Not reported
Feature 3:	Not reported
Agency:	DOD
URL:	Not reported
Name 1:	Barbers Point Naval Air Station (Closed)
Name 2:	Not reported
Name 3:	Not reported
State:	HI

---

1 **EWA ELEMENTARY SCHOOL** **LUST** **S104241259**
SE **91-1280 RENTON RD** **N/A**
1/2-1 **EWA BEACH, HI 96706**
4003 ft.

Relative:
Lower

Actual:
43 ft.

LUST:

Facility ID:	9-203565
Alternate Event ID:	990229
Facility Status Date:	11/04/1999
Facility Status:	Site Cleanup Completed
Project Officer:	Maniulit

spent until as of 1999

---

2 **EWA SUGAR MILL/OAHU SUGAR CO.** **CERCLIS** **1000483796**
SSE **RENTON ROAD** **SHWS** **HID984467605**
1/2-1 **EWA BEACH, HI 96706** **FINDS**
4212 ft. **SPILLS**

Relative:
Lower

Actual:
49 ft.

CERCLIS Classification Data:

Site Incident Category:	Not reported	Federal Facility:	Not a Federal Facility
Non NPL Status:	NFRAP		
Ownership Status:	Unknown	NPL Status:	Not on the NPL
Contact:	Eugenia Chow	Contact Tel:	(415) 972-3160
Contact Title:	Not reported		

CERCLIS Assessment History:

Assessment:	DISCOVERY	Completed:	10/31/1991
Assessment:	PRELIMINARY ASSESSMENT	Completed:	06/16/1993
Assessment:	SITE INSPECTION	Completed:	09/17/1999

CERCLIS Site Status:
NFRAP (No Futher Remedial Action Planned

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Comprehensive Environmental Response, Compensation and Liability Information System
Hawaii Environmental Compliance System

SHWS:

File Section :	Central
Type :	Private
Department 1 :	Not reported
Department 2 :	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Department 3 :	Not reported
Table :	Sitelist
Island :	Oahu
Zip :	Not reported
Discovery Assesment and Remediation :	Not reported
Initial Site Screening Team Lead :	Not reported
ISST Assigned :	Not reported
ISST Date :	Not reported
ISST Priority :	Not reported
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assesment :	Not reported
PA Lead :	Not reported
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	Not reported
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported
REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	Not reported
Input By :	Not reported
Case :	Not reported
Fed Id :	Not reported
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	Not reported
Priority :	Not reported
Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Not reported
EPCRA :	Not reported
EPCRA FIL :	Not reported
Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	CH
Event :	Not reported
Event Type :	Not reported
Notes :	Not reported
Site :	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Site_ :	Not reported
Operator :	Not reported
Current :	Not reported
Compounds :	Not reported
Oname :	Not reported
File Section :	Central
Type :	Private
Department 1 :	Not reported
Department 2 :	Not reported
Department 3 :	Not reported
Table :	Sitelist
Island :	Oahu
Zip :	Not reported
Discovery Assesment and Remediation :	Not reported
Initial Site Screening Team Lead :	Not reported
ISST Assigned :	Not reported
ISST Date :	Not reported
ISST Priority :	Not reported
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assesment :	No
PA Lead :	Not reported
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	No
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported
REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	01/09/95,12/93
Input By :	MJM,Adia/Tom
Case :	Not reported
Fed Id :	HID984467605
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	HEER
Priority :	High
Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Tom/Tricia
EPCRA :	Not reported
EPCRA FIL :	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	Not reported
Event :	Not reported
Event Type :	DS1 10/31/91 PA1 06/16/93
Notes :	Not reported
Site :	Not reported
Site_ :	Sugar Cultivation
Operator :	Not reported
Current :	Not reported
Compounds :	Not reported
Oname :	Not reported
File Section :	Central
Type :	Private
Department 1 :	Not reported
Department 2 :	Not reported
Department 3 :	Not reported
Table :	Sitelist
Island :	Oahu
Zip :	Not reported
Discovery Assesment and Remediation :	Not reported
Initial Site Screening Team Lead :	Amy Playdon
ISST Assigned :	Not reported
ISST Date :	8/10/00
ISST Priority :	NFA
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assesment :	Not reported
PA Lead :	Bryce
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	Amy
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported
REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	Not reported
Input By :	Not reported
Case :	Not reported
Fed Id :	HISFN0905534
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	Not reported
Priority :	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Not reported
EPCRA :	Not reported
EPCRA FIL :	Not reported
Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	Not reported
Event :	Not reported
Event Type :	Not reported
Notes :	Not reported
Site :	Not reported
Site_ :	Not reported
Operator :	Not reported
Current :	Not reported
Compounds :	Pesticides/PCBs, Triazine Herbicides, Chlorinated Herbicides, Petroleum, heavy metals
Oname :	Ewa Sugar Company; Oahu Sugar Company

HI SPILLS:

Reported Date:	07/11/97
Case Number:	19970711-1300
Island:	Oahu
Incident Description:	On May 7, 1997 a drum was located at the west end of Renton Road near the access gate to DOT property. Some black liquid had seeped onto the ground in the area of the drum. The drum is on its side.
Cause:	
Substances:	Not reported
Quantity:	Not reported
Media Affected:	Soil
Reportable Quantity:	Not reported
Category:	Not reported
Spill ?:	Not reported
Reported By:	Ross Kuge
Reporters Affiliation:	DOH HEER SDA
ERNS Number:	Not reported
Responder:	
Responder Affiliation:	
Initial Response:	
Release Date:	Not reported
Time of Release:	Not reported
Duration:	Not reported
Input By:	Marsha Graf
Date Input:	7/11/97
Staff 1:	Liz Galvez
Staff 2:	Not reported
Emergency Response:	Not reported
Initial Site Screening Team Rank:	Not reported
No Further Action:	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Priority:	Active
Comments:	
File Section:	Single
Type:	Not reported
Department 1:	Not reported
Department 2:	Not reported
Department 3:	Not reported
Cost Recovery:	Not reported
Official Notification:	Fugitive
Written Report:	Not reported
Confirmation Number:	Not reported
Pounds:	Not reported
Responsible Party:	No
Manifest Document Number:	Not reported
Units:	Not reported
Standard Cause:	Not reported
Numerical Quantity:	Not reported
Zip id:	Not reported
Initial Notification:	Not reported
Written Notification:	Not reported
Imminent And Substantial:	Not reported
Lat/Lon:	Not reported
Verification of source:	Not reported
Potential Quantity Amount:	Not reported
Potential Quantity Unit:	Not reported
Verification of source:	Not reported
Source Id:	Not reported
Responsible Party Name:	Not reported
RP Address:	Not reported
	Not reported
RP Contact:	Not reported
RP Phone Number:	Not reported
Verification Of RP:	Not reported
Responsible Party ID:	Not reported
Contractor Amount:	Not reported
Personnel Amount:	Not reported
Equipment Amount:	Not reported
Travel Amount:	Not reported
Miscallenous Amount:	Not reported
Federal Project Number:	Not reported
Pollution Removal Funding Auth:	Not reported
Authorization Date:	Not reported
Authorization Ceiling:	Not reported
Identfier:	Not reported

Total Environment Revolving Response Fund: 0

Reported Date:	08/23/97
Case Number:	19970823-1030
Island:	Oahu
Incident Description:	Explosions and chemical fumes coming from Ewa Sugar Mill.
Cause:	
Substances:	Not reported
Quantity:	Not reported
Media Affected:	Air
Reportable Quantity:	Not reported
Category:	Not reported
Spill ?:	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Reported By:	Thomas O'Connel
Reporters Affiliation:	Not reported
ERNS Number:	Not reported
Responder:	
Responder Affiliation:	
Initial Response:	
Release Date:	Not reported
Time of Release:	Not reported
Duration:	Not reported
Input By:	Marsha Graf
Date Input:	9/9/97
Staff 1:	Terry Corpus
Staff 2:	Not reported
Emergency Response:	Not reported
Initial Site Screening Team Rank:	Not reported
No Further Action:	Not reported
Priority:	NFA
Comments:	
File Section:	Central
Type:	Private
Department 1:	Ewa Sugar Mill
Department 2:	Not reported
Department 3:	Not reported
Cost Recovery:	Not reported
Official Notification:	Not reported
Written Report:	Not reported
Confirmation Number:	Not reported
Pounds:	Not reported
Responsible Party:	Not reported
Manifest Document Number:	Not reported
Units:	Not reported
Standard Cause:	Not reported
Numerical Quantity:	Not reported
Zip id:	Not reported
Initial Notification:	Not reported
Written Notification:	Not reported
Imminent And Substantial:	Not reported
Lat/Lon:	Not reported
Verification of source:	Not reported
Potential Quantity Amount:	Not reported
Potential Quantity Unit:	Not reported
Verification of source:	Not reported
Source Id:	Not reported
Responsible Party Name:	Not reported
RP Address:	Not reported
	Not reported
RP Contact:	Not reported
RP Phone Number:	Not reported
Verification Of RP:	Not reported
Responsible Party ID:	Not reported
Contractor Amount:	Not reported
Personnel Amount:	Not reported
Equipment Amount:	Not reported
Travel Amount:	Not reported
Miscallenous Amount:	Not reported
Federal Project Number:	Not reported
Pollution Removal Funding Auth:	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Authorization Date:	Not reported
Authorization Ceiling:	Not reported
Identfier:	Not reported
Total Environment Revolving Response Fund:	0
Reported Date:	04/20/98
Case Number:	19980420-0900
Island:	Oahu
Incident Description:	Resident noticed the odor of TCA or TCE at an excavation. Excavation covered by pieces of concrete.
Cause:	
Substances:	TCE
Quantity:	Not reported
Media Affected:	Air
Reportable Quantity:	Not reported
Category:	Not reported
Spill ?:	Not reported
Reported By:	Anonymous Resident
Reporters Affiliation:	Not reported
ERNS Number:	Not reported
Responder:	
Responder Affiliation:	
Initial Response:	
Release Date:	Not reported
Time of Release:	Not reported
Duration:	Not reported
Input By:	Marsha Graf
Date Input:	4/20/98
Staff 1:	Terry Corpus
Staff 2:	Not reported
Emergency Response:	Not reported
Initial Site Screening Team Rank:	Not reported
No Further Action:	NFA
Priority:	NFA
Comments:	HNU readings of covered pit did not detect organic vapors. Odors coming from active bus repair facility across street (dirt road) from covered pit.
File Section:	Central
Type:	Private
Department 1:	Not reported
Department 2:	Not reported
Department 3:	Not reported
Cost Recovery:	Not reported
Official Notification:	Fugitive
Written Report:	Not reported
Confirmation Number:	Not reported
Pounds:	Not reported
Responsible Party:	No
Manifest Document Number:	Not reported
Units:	Not reported
Standard Cause:	Leaking-Over Time
Numerical Quantity:	Not reported
Zip id:	Not reported
Initial Notification:	Not reported
Written Notification:	Not reported
Imminent And Substantial:	Not reported
Lat/Lon:	Not reported
Verification of source:	Not reported

EWA SUGAR MILL/OAHU SUGAR CO. (Continued) **1000483796**

Potential Quantity Amount:	Not reported
Potential Quantity Unit:	Not reported
Verification of source:	Not reported
Source Id:	Not reported
Responsible Party Name:	Not reported
RP Address:	Not reported
	Not reported
RP Contact:	Not reported
RP Phone Number:	Not reported
Verification Of RP:	Not reported
Responsible Party ID:	Not reported
Contractor Amount:	Not reported
Personnel Amount:	Not reported
Equipment Amount:	Not reported
Travel Amount:	Not reported
Miscallenous Amount:	Not reported
Federal Project Number:	Not reported
Pollution Removal Funding Auth:	Not reported
Authorization Date:	Not reported
Authorization Ceiling:	Not reported
Identfier:	Not reported
Total Environment Revolving Response Fund:	0

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3 **EWA REPAIR SHOP/TESORO (FORT WEAVE** **SHWS** **S104657412**
East **91-1669 FORT WEAVER ROAD** **N/A**
> 1 **EWA BEACH, HI 96706**
5713 ft.

Relative:
Lower

Actual:
42 ft.

SHWS:

File Section :	Central
Type :	Private
Department 1 :	Not reported
Department 2 :	Not reported
Department 3 :	BHP Gas Express (Station #43)
Table :	Sitelist
Island :	Oahu
Zip :	Not reported
Discovery Assesment and Remediation :	Not reported
Initial Site Screening Team Lead :	Not reported
ISST Assigned :	Not reported
ISST Date :	2/3/99
ISST Priority :	Low
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assesment :	Not reported
PA Lead :	Not reported
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	Not reported
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported

EWA REPAIR SHOP/TESORO (FORT WEAVE (Continued) **S104657412**

REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	2/5/99
Input By :	Amy Playdon
Case :	Not reported
Fed Id :	Not reported
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	Not reported
Priority :	Not reported
Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Not reported
EPCRA :	Not reported
EPCRA FIL :	Not reported
Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	Not reported
Event :	Not reported
Event Type :	Not reported
Notes :	7/11 wants to purchase property; conducted Phase I & II; submitted reports to HEER.
Site :	Not reported
Site_ :	Not reported
Operator :	Not reported
Current :	Not reported
Compounds :	Not reported
Oname :	Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
EWA	S103763662	PUU PALAILAI LANDFILL	91-402 FARRINGTON HIGHWAY	96706	SHWS
EWA	S104657423	HAWAIIAN ELECTRIC CO, INC. KAHE GE	89-900 FARRINGTON HWY	96706	SHWS, SPILLS
EWA	S104657424	HAWAIIAN ELECTRIC CO, INC. KAHE GE	89-900 FARRINGTON HWY	96706	SHWS
EWA BEACH	S104534123	CORAL WASTEPIT	(N/A)	96706	SHWS
EWA BEACH	S103763660	BARBERS POINT LANDFILL	BARBERS PT. NAVAL AIR STATION	96706	SHWS
EWA BEACH	1000151497	ADVANCED TECHNOLOGY INCINERATION	CAMBELL INDUSTRIAL PARK	96706	RCRIS-SQG, FINDS, RCRIS-TSD
EWA BEACH	1000486448	HAWAII RACEWAY PARK	CORNER OF KALAELOA BLVD / MA	96706	SHWS
EWA BEACH	S105481830	EWA VILLAGE PROJECT	CORNER OF RENTON RD X TENNY RD	96706	LUST
EWA BEACH	1000885455	JACKSON CONSTRUCTION LANDFILL	N END OF HANANUI ST.	96706	CERCLIS, SHWS, FINDS
EWA BEACH	1003879132	PACIFIC CONCRETE & ROCK LDFL	91-402 FARRINGTON HWY	96706	CERC-NFRAP
EWA BEACH	1006819246	KAPOLEI PIPELINE FUEL SPILL	KAMOKILA BLVD	96706	FINDS
EWA BEACH	1000474522	UNITEK ENVIRONMENTAL SERVICES INC	91-125 KAOMI LOOP	96706	PADS, RCRIS-LQG, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
EWA BEACH	S104534104	BREWER CHEMICAL CORPORATION	KAOMI LOOP RD	96706	SHWS
EWA BEACH	S104657402	BREWER CHEM CORP (BREWER ENVIRONM	KAOMI LOOP RD	96706	SHWS
EWA BEACH	1000346339	PEPPER INDUSTRIES	91-294 KAUHI ST	96706	RCRIS-SQG, FINDS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
EWA BEACH	S104534114	CHEMWOOD TREATMENT CO, INC.	91-476 KOMOHANA ST, CAMPBELL	96707	SHWS
EWA BEACH	1000146692	HAWAIIAN INDEPENDENT REFINERY INC	91-325 KOMOHANA ST	96706	FINDS, RCRIS-LQG, TRIS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
EWA BEACH	1000434528	CHEVRON USA HAWAIIAN REF	91-480 MALAKOLE RD	96706	SHWS, FINDS, RCRIS-LQG, TRIS, RCRIS-TSD, RAATS, CORRACTS, CERC-NFRAP
EWA BEACH	1001491876	EWA SUGAR MILL/OAHU SUGAR CO. - CO	.2 MILES EAST OF WHITE PLAINS	96706	CERCLIS, FINDS
EWA BEACH	1001491879	EWA SUGAR/OAHU SUGAR CO. - PESTICI	.8 MILES SOUTH OF FARRINGTON H	96706	CERCLIS, FINDS
EWA BEACH	S105262520	EAST MOORING BOUY SHEEN SIGHTING	EAST MOORING BUOY BARBERS POIN	96706	SPILLS
EWA BEACH	U003402913	KSSK-FM TRANSMITTER SITE	165 PALEHUA RIDGE (PALEHUA RD	96706	UST
EWA BEACH	1006843207	EWA BY GENTRY - EAST WASTEWATER	91-1250 FT WEAVER RD	96706	FINDS
EWA BEACH, OAHU	1000921765	HAWAIIAN WESTERN STEEL DUMP	HANUA ST. & MALAKOLE ST/CAMPBE	96706	RCRIS-SQG, SHWS, FINDS, RCRIS-TSD, CORRACTS, CERC-NFF
KAPOLEI	1000860458	HAWAII METAL RECYCLING CO	91 056 HANUA ST CAMPBELL IND	96707	CERCLIS, RCRIS-SQG, FINDS
KAPOLEI	S104534170	HANUA STREET FUGITIVE OIL	HANUA ST	96707	SHWS, SPILLS
KAPOLEI	S104657515	TEXACO MALAKOLE STREET PIPELINE EX	MALAKOLE ST	96707	SHWS, SPILLS
KAPOLEI	S104657409	DEEP DRAFT HARBOR PIER 5 CRUDE OIL	PIER 5 BARBORS POINT DEEP DRAF	96707	SHWS
KAPOLEI	S104657510	SINGLE BUOY MOORING BARBERS POINT	SINGLE BUOY MOORING BARBERS PO	96707	SHWS
KUNIA	S104657427	HAWAIIAN SUGAR PLANTER'S ASSOCIATI	KUNIA ROAD	96706	SHWS
MAKAKILO	U003222113	AERONAUTICAL RADIO, INC	MAKAKILO ON PALEHUA RIDGE	96707	UST
MAKAKILO	U003221640	PALEHUA OBSERVATORY	PALEHUA RD / BLDG 210	96707	UST
WAIMANALO GULCH, OAH	S106401346	WAIMANALO GULCH LANDFILL, EWA	94-460 FARRINGTON HWY	96707	SWF/LF

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/27/04
Date Made Active at EDR: 05/21/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 05/04/04
Elapsed ASTM days: 17
Date of Last EDR Contact: 05/04/04

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 04/27/04
Date Made Active at EDR: 05/21/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 05/04/04
Elapsed ASTM days: 17
Date of Last EDR Contact: 05/04/04

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 05/17/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 48
Date of Last EDR Contact: 06/23/04

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 05/17/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 48
Date of Last EDR Contact: 06/23/04

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/15/04
Date Made Active at EDR: 08/10/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/25/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 06/07/04

RCRIS: Resource Conservation and Recovery Information System
Source: EPA
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/15/04
Date Made Active at EDR: 07/20/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 06/23/04
Elapsed ASTM days: 27
Date of Last EDR Contact: 06/23/04

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/03
Date Made Active at EDR: 03/12/04
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/26/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 07/26/04

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01
Database Release Frequency: Biennially

Date of Last EDR Contact: 06/22/04
Date of Next Scheduled EDR Contact: 09/13/04

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ROD: Records Of Decision
Source: EPA
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/08/04
Database Release Frequency: Annually
Date of Last EDR Contact: 07/07/04
Date of Next Scheduled EDR Contact: 10/04/04

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/27/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/04/04
Date of Next Scheduled EDR Contact: 08/02/04

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 02/17/04
Database Release Frequency: Annually
Date of Last EDR Contact: 04/20/04
Date of Next Scheduled EDR Contact: 07/19/04

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/19/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 03/05/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/30/04
Date of Next Scheduled EDR Contact: 09/27/04

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 202-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 05/24/04
Date of Next Scheduled EDR Contact: 08/23/04

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-564-3887
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/30/04
Database Release Frequency: Annually
Date of Last EDR Contact: 05/12/04
Date of Next Scheduled EDR Contact: 08/09/04

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-692-8801
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/14/04
Date of Next Scheduled EDR Contact: 08/09/04

STORMWATER: Storm Water General Permits
Source: Environmental Protection Agency
Telephone: 202 564-0746
A listing of all facilities with Storm Water General Permits.

Date of Government Version: N/A
Database Release Frequency: Quarterly
Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

INDIAN RESERV: Indian Reservations
Source: USGS
Telephone: 202-208-3710
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/14/04
Date of Next Scheduled EDR Contact: 08/09/04

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/14/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/14/04
Date of Next Scheduled EDR Contact: 09/13/04

RMP: Risk Management Plans
Source: Environmental Protection Agency
Telephone: 202-564-8600
When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: N/A
Database Release Frequency: N/A

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

FUDS: Formerly Used Defense Sites
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 10/01/03
Database Release Frequency: Varies

Date of Last EDR Contact: 07/06/04
Date of Next Scheduled EDR Contact: 10/04/04

UMTRA: Uranium Mill Tailings Sites
Source: Department of Energy
Telephone: 505-845-0011
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized. In 1978, 24 inactive uranium mill tailings sites in Oregon, Idaho, Wyoming, Utah, Colorado, New Mexico, Texas, North Dakota, South Dakota, Pennsylvania, and on Navajo and Hopi tribal lands, were targeted for cleanup by the Department of Energy.

Date of Government Version: 04/22/04
Database Release Frequency: Varies

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 06/07/04
Date of Next Scheduled EDR Contact: 09/06/04

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-566-0250
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 06/22/04
Date of Next Scheduled EDR Contact: 09/20/04

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/02
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 06/07/04
Date of Next Scheduled EDR Contact: 09/06/04

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 04/13/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

SSTS: Section 7 Tracking Systems
Source: EPA
Telephone: 202-564-5008
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 07/20/04
Date of Next Scheduled EDR Contact: 10/18/04

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/13/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/21/04
Date of Next Scheduled EDR Contact: 09/20/04

STATE OF HAWAII ASTM STANDARD RECORDS

SHWS: Sites List
Source: Department of Health
Telephone: 808-586-4249
Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 07/12/01
Date Made Active at EDR: 10/16/01
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/24/01
Elapsed ASTM days: 22
Date of Last EDR Contact: 06/23/04

SWF/LF: Permitted Landfills in the State of Hawaii
Source: Department of Health
Telephone: 808-586-4245
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/19/04
Date Made Active at EDR: 06/22/04
Database Release Frequency: Varies

Date of Data Arrival at EDR: 05/20/04
Elapsed ASTM days: 33
Date of Last EDR Contact: 07/26/04

LUST: Leaking Underground Storage Tank Database
Source: Department of Health
Telephone: 808-586-4228
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 05/01/04
Date Made Active at EDR: 07/29/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/30/04
Elapsed ASTM days: 29
Date of Last EDR Contact: 06/30/04

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST: Underground Storage Tank Database
Source: Department of Health
Telephone: 808-586-4228
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 05/01/04
Date Made Active at EDR: 07/29/04
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/30/04
Elapsed ASTM days: 29
Date of Last EDR Contact: 06/30/04

VCP: Voluntary Response Program Sites
Source: Department of Health
Telephone: 808-586-4249

Date of Government Version: 10/10/03
Date Made Active at EDR: 10/21/03
Database Release Frequency: Varies

Date of Data Arrival at EDR: 10/13/03
Elapsed ASTM days: 8
Date of Last EDR Contact: 06/25/04

STATE OF HAWAII ASTM SUPPLEMENTAL RECORDS

SPILLS: Release Notifications
Source: Department of Health
Telephone: 808-586-4249
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 09/01/00
Database Release Frequency: Varies

Date of Last EDR Contact: 06/23/04
Date of Next Scheduled EDR Contact: 09/20/04

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

BROWNFIELDS DATABASES

BROWNFIELDS: Brownfields Sites
Source: Department of Health
Telephone: 808-586-4249

Date of Government Version: 10/10/03
Database Release Frequency: Varies

Date of Last EDR Contact: 06/25/04
Date of Next Scheduled EDR Contact: 09/20/04

VCP: Voluntary Response Program Sites
Source: Department of Health
Telephone: 808-586-4249

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/04/03
Database Release Frequency: Varies

Date of Last EDR Contact: 06/25/04
Date of Next Scheduled EDR Contact: 09/20/04

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: N/A
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

EAST KAPOLEI BROWNFIELD
EAST KAPOLEI BROWNFIELD
KAPOLEI, HI 96706

TARGET PROPERTY COORDINATES

Latitude (North):	21.349400 - 21° 20' 57.8"
Longitude (West):	158.044098 - 158° 2' 38.8"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	599117.5
UTM Y (Meters):	2360979.5
Elevation:	80 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

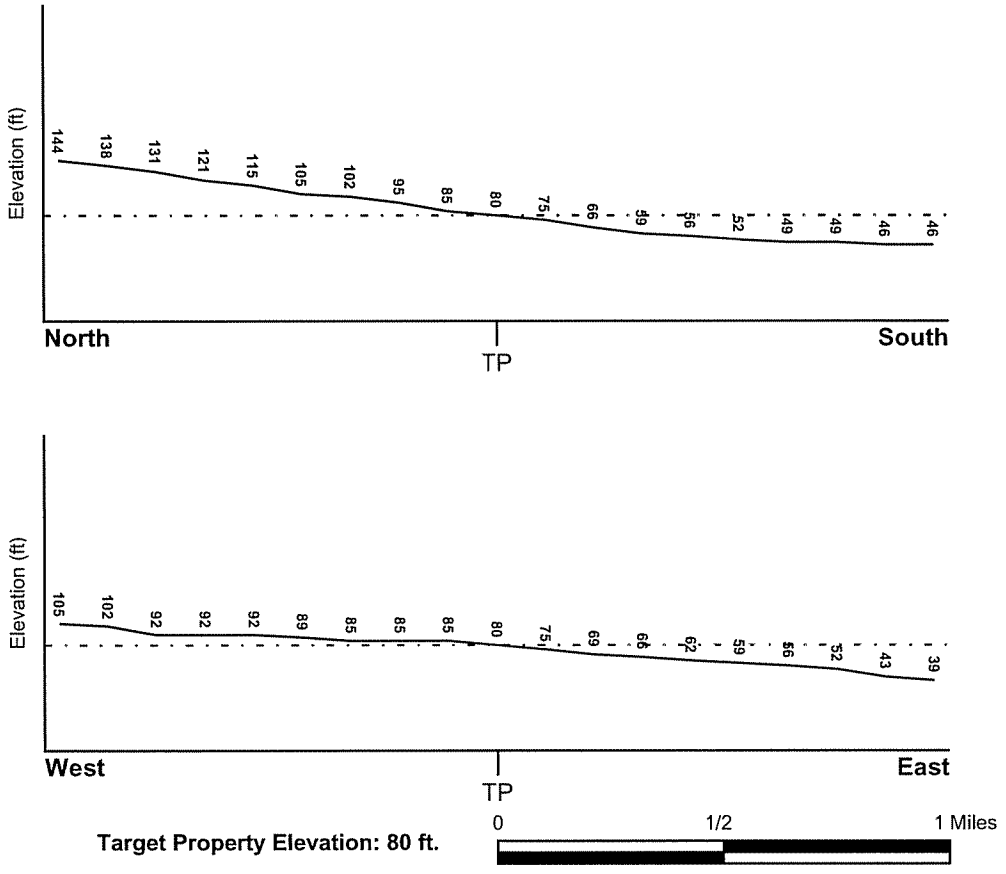
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	21158-C1 EWA, HI
General Topographic Gradient:	General SSE
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
HONOLULU, HI	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 1500010105A

Additional Panels in search area: 1500010110D
1500010130C
1500010135C

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
EWA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	-
System:	-
Series:	-
Code:	N/A *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: -

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	LUALUALEI
Soil Surface Texture:	extremely stony - clay
Hydrologic Group:	Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	MODERATE
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	10 inches	extremely stony - clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 7.30 Min: 6.60
2	10 inches	60 inches	extremely stony - clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 7.30 Min: 5.60

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: clay
stony - clay
very stony - clay

Surficial Soil Types: clay
stony - clay
very stony - clay

Shallow Soil Types: No Other Soil Types

Deeper Soil Types: clay
weathered bedrock
stony - clay

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources.... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	USGS0224680	1/2 - 1 Mile East
B4	USGS0224636	1/2 - 1 Mile SE
B5	USGS0224571	1/2 - 1 Mile SE
B6	USGS0224570	1/2 - 1 Mile SE
B7	USGS0224566	1/2 - 1 Mile SE
B8	USGS0224567	1/2 - 1 Mile SE
B18	USGS0224564	1/2 - 1 Mile SE
B19	USGS0224565	1/2 - 1 Mile SE
B20	USGS0224633	1/2 - 1 Mile SSE
B21	USGS0224631	1/2 - 1 Mile SSE
B22	USGS0224630	1/2 - 1 Mile SSE
C31	USGS0224690	1/2 - 1 Mile ENE
C32	USGS0224691	1/2 - 1 Mile ENE
C33	USGS0224694	1/2 - 1 Mile ENE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A2	3-2102-003	1/2 - 1 Mile East
3	3-2002-014	1/2 - 1 Mile SE
B9	3-2002-005	1/2 - 1 Mile SE
B10	3-2002-006	1/2 - 1 Mile SE
B11	3-2002-007	1/2 - 1 Mile SE
B12	3-2002-004	1/2 - 1 Mile SE
B13	3-2002-001	1/2 - 1 Mile SE
B14	3-2002-002	1/2 - 1 Mile SE
B15	3-2002-003	1/2 - 1 Mile SE
B16	3-2002-010	1/2 - 1 Mile SE
B17	3-2002-008	1/2 - 1 Mile SE
C23	3-2101-011	1/2 - 1 Mile ENE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
C24	3-2101-012	1/2 - 1 Mile ENE
C25	3-2101-010	1/2 - 1 Mile ENE
C26	3-2101-006	1/2 - 1 Mile ENE
C27	3-2101-005	1/2 - 1 Mile ENE
C28	3-2101-007	1/2 - 1 Mile ENE
C29	3-2101-009	1/2 - 1 Mile ENE
C30	3-2101-008	1/2 - 1 Mile ENE

PHYSICAL SETTING SOURCE MAP - 01253664.1r

County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location

TARGET PROPERTY:	East Kapolei Brownfield	CUSTOMER:	AMEC Earth and Environmental
ADDRESS:	East Kapolei Brownfield	CONTACT:	Brandis Ueyama
CITY/STATE/ZIP:	Kapolei HI 96706	INQUIRY #:	01253664.1r
LAT/LONG:	21.3494 / 158.0441	DATE:	August 19, 2004 7:54 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
A1 **East** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS0224680**

Agency:	USGS	Site ID:	212115158021001
Site Name:	3-2102-03 W273-1		
Dec. Latitude:	21.351		
Dec. Longitude:	-158.03337		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	60.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18910101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	Not Reported		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

	Database	EDR ID Number
A2 **East** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**3-2102-003**

Wid:	3-2102-003	Island Code:	3
Island Name:	Oahu	Well no:	2102-03
Well name:	Honouliuli	Old name:	Not Reported
Yr drilled:	1891	Driller:	Not Reported
Quad_map:	06	Latitude:	212115
Longitude:	1580210	UTM:	Y
Gps:	N	Owner/user:	Campbell Est
Old number:	273-1	Well_type:	DUG
Type:	Dug Well	Casing dia:	Not Reported
Ground Elev:	Not Reported	Well depth:	Not Reported
Solid casing Depth:	Not Reported	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	38	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported

Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	Not Reported	bot_solid depth:	Not Reported
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	9-1-017:014	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1891 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

3
SE
1/2 - 1 Mile
Lower

HI WELLS **3-2002-014**

Wid:	3-2002-014	Island Code:	3
Island Name:	Oahu	Well no:	2002-14
Well name:	West Loch Cap 2	Old name:	Not Reported
Yr drilled:	1993	Driller:	ROSCOE MOSS
Quad_map:	06	Latitude:	212041
Longitude:	1580214	UTM:	N
Gps:	Y	Owner/user:	C&C Honolulu
Old number:	Not Reported	Well_type:	ROT
Type:	Rotary Drill	Casing dia:	11
Ground Elev:	Not Reported	Well depth:	70
Solid casing Depth:	40	Perf casing Depth:	68
Use:	UNU	Use Desc:	Unused
Use year:	93	Water Top Elev:	0
Chloride value:	450	Test date:	07/07/1993 00:00:00
Pumping Test rate:	800	Drop in water Lvl:	8.8
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	Not Reported	bot_solid depth:	Not Reported
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	9-1-017:049	Aquifer code:	30209
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	10/15/1993 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

B4
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224636**

Agency:	USGS	Site ID:	212034158022201
Site Name:	3-2002-01 W273-A EWA		
Dec. Latitude:	21.33962		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	47.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18910101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	507		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B5
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224571**

Agency:	USGS	Site ID:	212033158022201
Site Name:	3-2002-03 W273 EWA		
Dec. Latitude:	21.33934		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18990101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	551		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B6
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224570**

Agency:	USGS	Site ID:	212033158022101
Site Name:	3-2002-04 W273-C EWA		
Dec. Latitude:	21.33934		
Dec. Longitude:	-158.03642		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18990101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	550		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B7
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224566**

Agency:	USGS	Site ID:	212032158022201
Site Name:	3-2002-02 W273-D EWA		
Dec. Latitude:	21.33906		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18910101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	523		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B8
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224567**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Agency:	USGS	Site ID:	212032158022209
Site Name:	3-2002-10 W273-I EWA		
Dec. Latitude:	21.33906		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	40.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	19440401	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	213		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B9
SE
1/2 - 1 Mile
Lower

HI WELLS **3-2002-005**

Wid:	3-2002-005	Island Code:	3
Island Name:	Oahu	Well no:	2002-05
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1900	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-E	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	46	Well depth:	522
Solid casing Depth:	450	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	46	Water Top Elev:	0
Chloride value:	385	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-476	bot_solid depth:	-404
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/02/1900 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
B10 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**3-2002-006**

Wid:	3-2002-006	Island Code:	3
Island Name:	Oahu	Well no:	2002-06
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1900	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-F	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	46	Well depth:	518
Solid casing Depth:	445	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	46	Water Top Elev:	0
Chloride value:	385	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-472	bot_solid depth:	-399
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/02/1900 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

	Database	EDR ID Number
B11 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**3-2002-007**

Wid:	3-2002-007	Island Code:	3
Island Name:	Oahu	Well no:	2002-07
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1908	Driller:	Not Reported
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-G	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	46	Well depth:	498

Solid casing Depth:	Not Reported	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	42	Water Top Elev:	0
Chloride value:	585	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	3.1
Geology:	QA	Geology desc:	Younger non-calcareous sediments
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-452	bot_solid depth:	Not Reported
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	3.1	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1908 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

B12
SE
1/2 - 1 Mile
Lower

HI WELLS **3-2002-004**

Wid:	3-2002-004	Island Code:	3
Island Name:	Oahu	Well no:	2002-04
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1899	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-C	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	46	Well depth:	550
Solid casing Depth:	450	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	46	Water Top Elev:	0
Chloride value:	454	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-504	bot_solid depth:	-404
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1899 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database	EDR ID Number
HI WELLS	3-2002-001

B13
SE
1/2 - 1 Mile
Lower

Wid:	3-2002-001	Island Code:	3
Island Name:	Oahu	Well no:	2002-01
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1891	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-A	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	47	Well depth:	507
Solid casing Depth:	419	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	66	Water Top Elev:	0
Chloride value:	417	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	8.6
Geology:	QA	Geology desc:	Younger non-calcareous sediments
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-460	bot_solid depth:	-372
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	8.6	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1891 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

Database	EDR ID Number
HI WELLS	3-2002-002

B14
SE
1/2 - 1 Mile
Lower

Wid:	3-2002-002	Island Code:	3
Island Name:	Oahu	Well no:	2002-02
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1891	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-D	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	8
Ground Elev:	46	Well depth:	523

Solid casing Depth:	450	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	46	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	17.0
Geology:	QA	Geology desc:	Younger non-calcareous sediments
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-477	bot_solid depth:	-404
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	17	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1891 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

B15
SE
1/2 - 1 Mile
Lower

HI WELLS **3-2002-003**

Wid:	3-2002-003	Island Code:	3
Island Name:	Oahu	Well no:	2002-03
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1899	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-B	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	46	Well depth:	551
Solid casing Depth:	438	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	46	Water Top Elev:	16.6
Chloride value:	1184	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-505	bot_solid depth:	-392
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1899 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
B16 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**3-2002-010**

Wid:	3-2002-010	Island Code:	3
Island Name:	Oahu	Well no:	2002-10
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1944	Driller:	NAT WHITON
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Not Reported
Old number:	273-I	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	40	Well depth:	213
Solid casing Depth:	Not Reported	Perf casing Depth:	Not Reported
Use:	IND	Use Desc:	Industrial
Use year:	74	Water Top Elev:	0
Chloride value:	2980	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	QA	Geology desc:	Younger non-calcareous sediments
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-173	bot_solid depth:	Not Reported
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1944 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

	Database	EDR ID Number
B17 **SE** **1/2 - 1 Mile** **Lower**	**HI WELLS**	**3-2002-008**

Wid:	3-2002-008	Island Code:	3
Island Name:	Oahu	Well no:	2002-08
Well name:	Ewa	Old name:	Not Reported
Yr drilled:	1908	Driller:	Not Reported
Quad_map:	06	Latitude:	212032
Longitude:	1580222	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	273-H	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	46	Well depth:	497

Solid casing Depth:	464	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	42	Water Top Elev:	0
Chloride value:	585	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	13.1
Geology:	QA	Geology desc:	Younger non-calcareous sediments
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-451	bot_solid depth:	-418
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	13.1	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1908 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

B18
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224564**

Agency:	USGS	Site ID:	212032158022100
Site Name:	3-2002-01 TO 08 10		
Dec. Latitude:	21.33906		
Dec. Longitude:	-158.03642		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	47.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	Not Reported	Inven Date:	Not Reported
Well Type:	Multiple wells (a group of wells that are pumped through a single header)		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	Not Reported		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B19
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0224565**

Agency:	USGS	Site ID:	212032158022101
Site Name:	3-2002-06 W273-F EWA		
Dec. Latitude:	21.33906		
Dec. Longitude:	-158.03642		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	19000101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	518		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B20
SSE **FED USGS** **USGS0224633**
1/2 - 1 Mile
Lower

Agency:	USGS	Site ID:	212031158022201
Site Name:	3-2002-05 W273-E EWA		
Dec. Latitude:	21.33878		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	19000101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	522		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B21
SSE **FED USGS** **USGS0224631**
1/2 - 1 Mile
Lower

Agency:	USGS	Site ID:	212030158022201
Site Name:	3-2002-08 W273-H EWA		
Dec. Latitude:	21.33851		
Dec. Longitude:	-158.0367		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	19080101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	497		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

B22
SSE **FED USGS** **USGS0224630**
1/2 - 1 Mile
Lower

Agency:	USGS	Site ID:	212030158022101
Site Name:	3-2002-07 W273-G EWA		
Dec. Latitude:	21.33851		
Dec. Longitude:	-158.03642		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	46.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	19080101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	498		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

C23
ENE **HI WELLS** **3-2101-011**
1/2 - 1 Mile
Lower

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Wid:	3-2101-011	Island Code:	3
Island Name:	Oahu	Well no:	2101-11
Well name:	Honouliuli	Old name:	Not Reported
Yr drilled:	1899	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Not Reported
Old number:	268-H	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	30	Well depth:	450
Solid casing Depth:	316	Perf casing Depth:	Not Reported
Use:	Not Reported	Use Desc:	Not Reported
Use year:	Not Reported	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-420	bot_solid depth:	-286
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1899 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C24
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-012**

Wid:	3-2101-012	Island Code:	3
Island Name:	Oahu	Well no:	2101-12
Well name:	Honouliuli A	Old name:	Not Reported
Yr drilled:	1901	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-A	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	30	Well depth:	452
Solid casing Depth:	298	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	16.5
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported

Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-422	bot_solid depth:	-268
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	16.5	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1901 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C25
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-010**

Wid:	3-2101-010	Island Code:	3
Island Name:	Oahu	Well no:	2101-10
Well name:	Honouliuli G	Old name:	Not Reported
Yr drilled:	1899	Driller:	MCCANDLESS
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-G	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	12
Ground Elev:	30	Well depth:	462
Solid casing Depth:	304	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	16.0
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-432	bot_solid depth:	-274
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	16	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1899 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C26
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-006**

Wid:	3-2101-006	Island Code:	3
Island Name:	Oahu	Well no:	2101-06
Well name:	Honouliuli C	Old name:	Not Reported
Yr drilled:	1890	Driller:	Not Reported
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-C	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	30	Well depth:	451
Solid casing Depth:	310	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-421	bot_solid depth:	-280
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1890 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C27
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-005**

Wid:	3-2101-005	Island Code:	3
Island Name:	Oahu	Well no:	2101-05
Well name:	Honouliuli B	Old name:	Not Reported
Yr drilled:	1890	Driller:	Not Reported
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-B	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	30	Well depth:	456
Solid casing Depth:	320	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	Not Reported
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported

Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-426	bot_solid depth:	-290
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	0	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1890 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C28
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-007**

Wid:	3-2101-007	Island Code:	3
Island Name:	Oahu	Well no:	2101-07
Well name:	Honouliuli D	Old name:	Not Reported
Yr drilled:	1890	Driller:	Not Reported
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-D	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	30	Well depth:	468
Solid casing Depth:	302	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	15.4
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-438	bot_solid depth:	-272
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	15.4	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1890 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C29
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-009**

Wid:	3-2101-009	Island Code:	3
Island Name:	Oahu	Well no:	2101-09
Well name:	Honouliuli F	Old name:	Not Reported
Yr drilled:	1890	Driller:	Not Reported
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-F	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	31	Well depth:	448
Solid casing Depth:	432	Perf casing Depth:	448
Use:	OBS	Use Desc:	Observation
Use year:	77	Water Top Elev:	31.5
Chloride value:	342	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	17.5
Geology:	TKB	Geology desc:	Tertiary Koolau basalt
Installed:	Not Reported	Last Measured:	Not Reported
Max chlorides:	Not Reported	Max Cl year:	0
Min chlorides:	Not Reported	Min Cl year:	0
Bot_hole depth:	-417	bot_solid depth:	-401
Bot_perf depth:	-417	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	17.5	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1890 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C30
ENE
1/2 - 1 Mile
Lower

HI WELLS **3-2101-008**

Wid:	3-2101-008	Island Code:	3
Island Name:	Oahu	Well no:	2101-08
Well name:	Honouliuli E	Old name:	Not Reported
Yr drilled:	1890	Driller:	Not Reported
Quad_map:	06	Latitude:	212131
Longitude:	1580159	UTM:	Y
Gps:	N	Owner/user:	Ewa Plantn
Old number:	268-E	Well_type:	Not Reported
Type:	Not Reported	Casing dia:	10
Ground Elev:	30	Well depth:	462
Solid casing Depth:	310	Perf casing Depth:	Not Reported
Use:	SLD	Use Desc:	Sealed
Use year:	52	Water Top Elev:	0
Chloride value:	0	Test date:	Not Reported
Pumping Test rate:	Not Reported	Drop in water Lvl:	Not Reported
Chloride Test:	Not Reported	Temperature:	Not Reported
Units:	Not Reported	Pump Capacity:	0
Annual Draft:	Not Reported	Static Water Lvl:	17.6
Geology:	Not Reported	Geology desc:	Not Reported
Installed:	Not Reported	Last Measured:	Not Reported

Max chlorides:	Not Reported	Max Cl year:	Not Reported
Min chlorides:	Not Reported	Min Cl year:	Not Reported
Bot_hole depth:	-432	bot_solid depth:	-280
Bot_perf depth:	Not Reported	Well Capacity:	Not Reported
Pump Capacity:	Not Reported	Draft (mgd):	Not Reported
Tax map key:	Not Reported	Aquifer code:	30203
Latest head mmt:	17.6	Cur head mmt:	Not Reported
Current Cl mmt:	Not Reported	Const. Date:	01/01/1890 00:00:00
Pump Inst. Date:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0	Pump intake elev:	Not Reported
Pump depth:	Not Reported		

C31
ENE
1/2 - 1 Mile
Lower

FED USGS **USGS0224690**

Agency:	USGS	Site ID:	212131158015901
Site Name:	3-2101-05 W268-B		
Dec. Latitude:	21.35545		
Dec. Longitude:	-158.03031		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	30.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18900101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	456		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

C32
ENE
1/2 - 1 Mile
Lower

FED USGS **USGS0224691**

Agency:	USGS	Site ID:	212131158015905
Site Name:	3-2101-09 W268-F		
Dec. Latitude:	21.35545		
Dec. Longitude:	-158.03031		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	31.00		
Hydrologic code:	20060000		
Topographic:	Flat surface		
Site Type:	Ground-water other than Spring		
Const Date:	18900101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		

Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	448		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1890-05-01	-0.50	

C33
ENE
1/2 - 1 Mile
Lower

FED USGS **USGS0224694**

Agency:	USGS	Site ID:	212132158015901
Site Name:	3-2101-08 W268-E		
Dec. Latitude:	21.35573		
Dec. Longitude:	-158.03031		
Coord Sys:	NAD83		
State:	HI		
County:	Honolulu County		
Altitude:	30.00		
Hydrologic code:	20060000		
Topographic:	Not Reported		
Site Type:	Ground-water other than Spring		
Const Date:	18900101	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	462		
Hole depth:	Not Reported	Source:	Not Reported
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 0

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RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for HONOLULU County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 96706

Number of sites tested: 6

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.150 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	-0.200 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

Ground Water Wells
Source: Department of Land and Natural Resources
Telephone: 808-587-0242

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

APPENDIX E

Site Reconnaissance Photos

Photo 001 – View of TMK 1-9-1-017-071 facing southwest

Photo 002 – View of TMK 1-9-1-017-071 facing west

Photo 003 – View of TMK 1-9-1-017-088 facing south

Photo 004 – View of TMK 1-9-1-017-086 facing north

Photo 005 – View of TMK 1-9-1-018-005 facing northeast

Photo 006 – View of TMK 1-9-1-016-008

Photo 007 – OSC Pesticide Mixing and Loading Area, view facing north


Photo 008 – View of above ground tanks

Photo 009 – View of diesel tank within the "Boiler House"

Photo 010 – View of Suspected Pesticide Mixing and Loading Area

Photo 011 – Close up view of empty pesticide containers in Photo 010

Photo 012 – Standing Water view facing south

Photo 013 – Suspected Pesticide Mixing and Loading Area and location of standing water

APPENDIX F

Engineering Evaluation and Cost Analysis

REMEDIAL OPTIONS ENGINIEERING EVALUATION/COST ANALAYSIS

Based on the results of the characterization sample analysis, remedial options for the OSC Pesticide Mixing and Loading Site would address the dioxin-contaminated soils. The levels of dioxin in soils currently present a human health risk under a residential land use scenario. The human health risk is clean-up level for dioxin is 1 ppb for residential land use, as established by OSWER Directive 9200.4-6.

Remedial Objectives

The primary focus of this remedial action is to address the dioxin contaminated soils in the OSC Pesticide Mixing and Loading area to provide long-term protection to human receptors under a residential land use scenario. The following remedial objectives are presented below:

- Remediate dioxin contaminated soil to a 1 ppb action level as established by OSWER Directive 9200.4-6 for residential land use scenario;
- Minimize direct contact with the dioxin contaminated soil; and,
- Minimize the potential risk to human health receptors from exposure to the dioxin contaminated soil.

Summary of Remedial Options

Three (3) remedial options considered to the remedial objectives at the OSC Pesticide Mixing and Loading Area include:

1. Excavation, transport and incineration of dioxin contaminated soil at an off-island approved facility;
2. Excavation and incineration of dioxin contaminated soil on-site, returning the soil to the excavation; and
3. Soil Cover.

Each of these remedial options were evaluated against three screening criteria:

- effectiveness;
- implementability; and,
- cost.

The effectiveness criterion addresses the ability of the remedial option to provide:

- overall protection to human health and the environment;
- short-term effectiveness;
- reduction of the toxicity, mobility, and volume of contaminants by treatment;
- long-term effectiveness and permanence; and,
- compliance with regulatory issues and requirements.

The implementability criterion addresses:

- technical feasibility of implementing a remedial option (i.e., technology reliability, operational difficulties, logistics, climate and terrain limitations);
- administrative feasibility of implementing a remedial option (i.e., coordination of activities, permits, easements, right-of-way agreements, and zoning variances); and,
- availability of materials and services required during implementation.

The cost criterion addresses:

- relative magnitude to implement a remedial option to address the dioxin contaminated soil at the OSC Pesticide Mixing and Loading Area.

The following assumptions were made in the development of the three remedial alternatives:

- The decommissioning and removal of the structures at the OSC Pesticide Mixing and Loading area are not considered part of the general tasks for the remedial alternatives, as this item would be required for all the alternatives. Its use for comparative analysis is not required because the costs are associated with these tasks have not been included in the costs of the remedial options.

- According the to USEPA, land disposal of dioxin contaminated soil is prohibited.
- No import backfill material is required for the excavations. Any borrow material for backfill will be obtained from nearby parcels.

Remedial Option 1: Excavation, transport and incineration of dioxin contaminated soil at an off-island approved facility

This remedial option would consist of excavation of the dioxin contaminated soils, packaging and transport of the soil to an off-island approved facility for incineration, and disposal of remediated soil. The general task activities under this remedial option include:

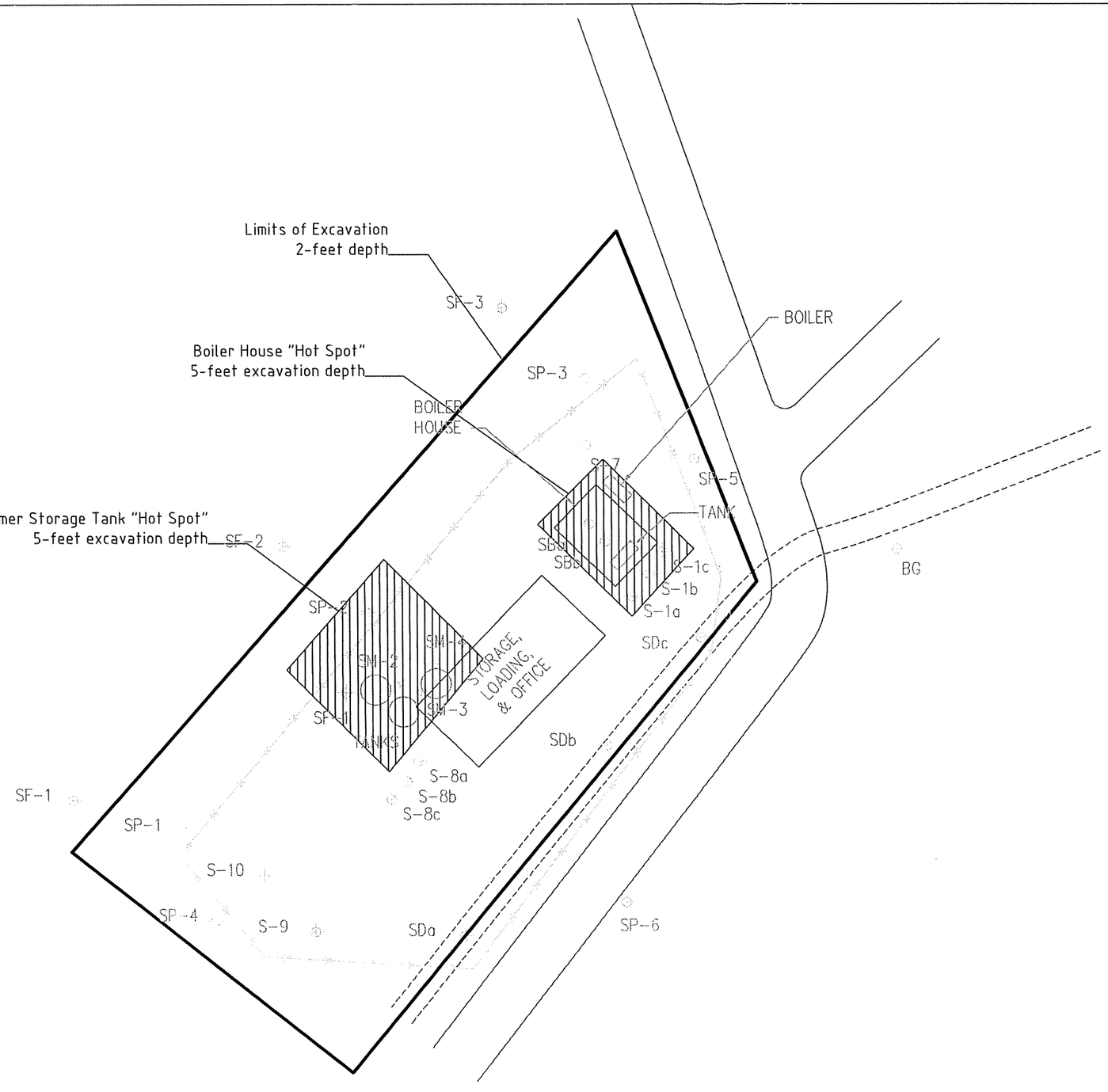
- site survey;
- clearing and grubbing;
- soil excavation;
- packaging and transport of excavated soil at an off-island approved facility
- confirmation sampling;
- incineration to remediate excavated soils; and,
- disposal of the soil

Prior to initiating site activities, a site survey by a Land Surveyor licensed in the State of Hawaii should be performed to delineate the area of concerns for implementation of cleanup actions. Accurate mapping of the areas will allow more precise and accurate determination of excavation areas and volumes, staging areas locations, and boundary limits for areas of concern. The survey will minimize lateral and vertical over excavation, which will minimize costs of additional packaging, transport, and incineration of the excavated soils.

Clearing and grubbing of the brush will be required prior to excavation. The brush should be cut as low to the ground surface, mulched and spread out at a nearby site. Tree roots larger than 3-inches in diameter will have to be removed. Soil associated with root removal will require removal to the extent feasibly possible prior to disposal.

The volume of soil removed is based on dioxin levels read from the December 2000 sampling results, where the depth and extent of excavation is designed to capture soils with dioxin concentrations of 1 ppb TEQ[1] or greater. Two “hot spots” identified in Figure F-1 would be

[1] Dioxin/dibenzofuran total toxicity equivalents



Limits of Excavation
OSC Pestcide Mixing and Loading Area
East Kapolei Brownsfield

LEGEND

NOTES

1. The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.
2. Projection:
3. File:.AMEC/Figure 3.dwg
4. Date: 08/27/04

SOURCES

1. Extent of Contamination Report Lockheed Martin, December 2000

N

25 0 25 50

Feet

FIGURE

F-1

excavated to 5 feet below ground surface (bgs). The two "hot spots" area identified as the area surrounding the elevated mixing tanks and the area where the "Boiler House" is located. These two regions have areas of approximately 3,700 ft^2 and 2,100 ft^2, respectively. Sampling data obtained in these hot spot regions shows dioxin concentrations of greater than 1 ppb at least four (4) feet in depth, therefore these areas would be excavated to five (5) feet bgs in an effort to capture soils with dioxin concentrations greater than 1 ppb. The total volume of excavated soil from these two "hot spots" yields approximately 1,074 "bank" cubic yards (BCY). After excavation, the soil is anticipated to expand as air and water void volume increases. The soil expansion factor for clay is assumed at 30%, and therefore after excavation, the soil is anticipated to expand in volume to approximately 1,396 "loose" cubic yards (LCY).

The remaining soil area at the site (approximately 37,900 ft^2) would be excavated to 2 feet bgs for a volume of 2,807 BCY. Using the expansion factor noted above, a volume of 3,650 LCY is anticipated. The total volume of excavated soil for the entire site is estimated at 5,046 LCY (approximately 7,569 tons, at 1.5 tons/CY). The excavated soil will be placed in 1.5 CY "super-sack" bags, and placed in shipping container, and transported to an approved facility for incineration. After incineration and remediation, the soil shall be disposed at an approved facility. The excavated site will be filled with clean fill and covered with sod grass.

After the completion of excavation activities, confirmation sampling will be conducted at the bottom of the excavation areas to verify that the remaining on-site soils in the excavation areas meet the cleanup level of 1 ppb for dioxins. It is anticipated only the mean concentration across the site is required, and therefore a single composite sample will be collected from twenty random points within the excavation area.

The transported dioxin-contaminated soil will be incinerated and treated at facility prior to disposal. The dioxin-contaminated soil will be remediated below the established 1 ppb action level. After incineration and remediation, the soil shall be disposed of at an approved facility.

Effectiveness

Excavation and treatment of the soils would remove the dioxin contamination to acceptable action levels under the residential land use scenario by reducing toxicity, mobility, and volume of contamination. The removal and remediation of the contaminated soil would also minimize the risks to human health and environmental receptors at the site. It would be effective as a long-term solution to protect human health and the environment. Air monitoring and fugitive dust suppression activities would provide short-term effectiveness in protecting the community and workers during implementation of the remedial option. This alternative would also be in compliance with regulatory requirements.

Implementability

Remedial Option 1 is technically and administratively feasible to implement at the site. Conventional construction equipment and materials required for remedial activities are readily available. Dust control measures, such as wet down procedures, may be required to minimize dust emissions during implementation of cleanup actions. Specialized incineration equipment to remediate dioxin-contaminated soil to the action level of 1 ppb is available.

Cost

The nearest facility to Hawaii that accepts dioxin-contaminated soil is Canada; there are no incinerators in the U.S. that accept such soils. Costs associated with shipping, incineration, and are estimated to be $1200 per ton of soil. Approximately 7,700 tons (7,569 tons plus approximately 2% extra) are required for transport and disposal. The estimated cost for shipping, incineration, and disposal are $9,180,000. The total anticipated cost, (including site survey, clearing, and grubbing) for this alternative is $9,373,600.

Remedial Option 2: Excavation and incineration of dioxin contaminated soil on-site, and returning remediated soil to excavation.

This remedial option would consist of excavation of the dioxin contaminated soils and incineration of soil at a staging area on-site, and returning the remediated soil back to the excavation. The general task activities under this remedial option include:

- site survey
- mobilization of incineration equipment;
- clearing and grubbing;
- soil excavation;
- confirmation sampling; and
- incineration to remediate excavated soils;

Prior to initiating site activities, a site survey by a Land Surveyor licensed in the State of Hawaii should be performed to delineate the area of concerns for implementation of cleanup actions. Accurate mapping of the areas will allow more precise and accurate determination of excavation areas and volumes, staging areas locations, and boundary limits for areas of concern. The survey will minimize lateral and vertical over excavation, which will minimize costs of additional packaging, transport, and incineration of the excavated soils.

The incineration equipment necessary to remediate dioxin contaminated soil will have to be mobilized to the OSC Pesticide Mixing and Loading Area from an off-island location.

Clearing and grubbing of the brush will be required prior to excavation. The brush should be cut as low to the ground surface, mulched and spread out at a nearby site. Tree roots larger than 3-inches in diameter will have to be removed. Soil associated with root removal will require removal to the extent feasibly possible prior to disposal.

The volume of soil removed is based on dioxin levels read from the December 2000 sampling results, where the depth and extent of excavation is designed to capture soils with dioxin concentrations of 1 ppb TEQ[2] or greater. Two "hot spots" identified in Figure F-1 would be excavated to 5 feet below ground surface (bgs). The two "hot spots" area identified as the area surrounding the elevated mixing tanks and the area where the "Boiler House" is located. These

[2] Dioxin/dibenzofuran total toxicity equivalents

two regions have areas of approximately 3,700 ft^2 and 2,100 ft^2, respectively. Sampling data obtained in these hot spot regions shows dioxin concentrations of greater than 1 ppb at least four (4) feet in depth, therefore these areas would be excavated to five (5) feet bgs in an effort to capture soils with dioxin concentrations greater than 1 ppb. The total volume of excavated soil from these two "hot spots" yields approximately 1,074 "bank" cubic yards (BCY). After excavation, the soil is anticipated to expand as air and water void volume increases. The soil expansion factor for clay is assumed at 30%, and therefore after excavation, the soil is anticipated to expand in volume to approximately 1,396 "loose" cubic yards (LCY).

The remaining soil area at the Site (approximately 37,900 ft^2) would be excavated to 2 feet bgs for a volume of 2,807 BCY. Using the expansion factor noted above, a volume of 3,650 LCY is anticipated. The total volume of excavated soil for the entire site is estimated at 5,046 LCY (approximately 7,569 tons, at 1.5 tons/CY). Will be incinerated at an approved incineration facility established near the site. After incineration, remediated soil will be returned to the excavated site and subsequently covered with sod grass.

After the completion of excavation activities, confirmation sampling will be conducted at the bottom of the excavation areas to verify that the remaining on-site soils in the excavation areas meet the cleanup level of 1 ppb dioxin. It is anticipated only the mean concentration across the site is required, and therefore a single composite sample will be collected from twenty random points within the excavation area.

Effectiveness

Excavation and treatment of the soils would remove the dioxin contamination to acceptable action levels under the residential land use scenario by reducing toxicity, mobility, and volume of contamination. The removal and remediation of the contaminated soil would also minimize the risks to human health and environmental receptors at the site. It would be effective as a long-term solution to protect human health and the environment. Air monitoring and fugitive dust suppression activities would provide short-term effectiveness in protecting the community and workers during implementation of the remedial option. This alternative would also be in compliance with regulatory requirements.

Implementability

Remedial Option 2 is technically and administratively feasible to implement at the site. Conventional construction equipment and materials required for remedial activities are readily available. Dust control measures, such as wet down procedures, may be required to minimize dust emissions during implementation of cleanup actions. Specialized incineration equipment to remediate dioxin-contaminated soil to the action level of 1 ppb is available.

Cost

According to Environmental Chemical Corporation, Inc., a subcontractor with the specialized incineration equipment, indicated incineration fees would cost approximately $3,860,700 including the mobilization of the equipment to the OSC Pesticide Mixing and Loading Area. The total cost (including site survey, clearing, and grubbing) is estimated at $3,930,900.

Remedial Option 3: Soil Cover

This remedial option would consist of constructing a soil cover over area of the dioxin-contaminated soils OSC Pesticide Mixing and Loading Area identical to the extent of excavation in Figure 1. The soil cover would be composed of a geotextile fabric and two-foot thick layer of soil materials. The geotextile fabric will be placed over the surface to prevent exposure of the dioxin-contaminated soil if ecological or human receptors should uncover the soil cover materials. The task activities under this remedial option include:

- site survey;
- clearing and grubbing vegetation;
- install geotextile fabric layer and place soil layer for soil cover;
- vegetation of soil cover; and,
- site restoration.

Prior to initiating site activities, a site survey by a Land Surveyor licensed in the State of Hawaii should be performed to delineate the area of concerns for implementation of cleanup actions. Accurate mapping of the areas will allow more precise determination of soil cover material.

Clearing and grubbing of the brush will be required prior to placing the geotextile and soil cover. The brush should be cut as low to the ground surface, mulched and spread out at a nearby site. Tree roots larger than 3-inches in diameter will have to be removed. Soil associated with root removal will require removal to the extent feasibly possible prior to disposal. After clearing and grubbing the site will require careful inspection of the surface prior to geotextile installation to ensure sharp objects do not protrude from the ground surface to puncture the geotextile during installation.

After the installation of the geotextile, a soil cover will be placed, compacted, and graded to promote surface water run-off and prevent ponding of water on the surface of the cover. Soil cover materials will be obtained from off-site sources.

The site will then be vegetated with grasses and restored to similar pre-excavation site conditions. Appropriate surface water and stormwater controls will be installed to minimize erosion and enhance the integrity of the soil cover. Periodic maintenance will be required while vegetation growth is established on the soil cover.

Effectiveness

Placement of a soil cover would not reduce toxicity, mobility, and volume of dioxin contamination. The soil cover would minimize direct contact with ecological and human receptors, therefore minimizing the exposure pathway of receptors to dioxin contaminated soils. It would be effective in the long term to protect human health and the environment after completion of cleanup actions. Performance of air monitoring activities would provide short-term effectiveness in protecting the community and workers during implementation of the remedial option.

Implementability

This remedial option is implementable at the site. Conventional construction equipment and materials required for remedial activities are readily available. Purchase of soil cover materials from off-site sources will be required. Dust control measures, such as wet down procedures, may be required to minimize dust emissions during implementation of cleanup actions.

Cost

The cost to construct a soil cover, including mobilization and demobilization of equipment, and maintenance of the soil cover for a period of 30 years is approximately $268,300. This cost includes site preparation, site controls, geotextile fabric installation, soil placement, site grading, materials, revegetation of soil cover, site restoration costs and maintenance costs for 30-year period.

Comparative Analysis of Remedial Options

This section compares the performance of each remedial option relative to each evaluation criteria (effectiveness, implementability, and cost). The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect remedy selection can be identified.

The results of the comparative analysis are presented in Table 8-2. The analysis is based on a numerical rating system that assigns a value according to the following rules:

- A value of “1” is awarded of the remedial option satisfies/fulfills less than half of the elements of the evaluation criteria;
- A value of “2” is awarded of the remedial option satisfies/fulfills more than half of the elements of the evaluation criteria; and,
- A value of “3” is awarded of the remedial option satisfies/fulfills all elements of the evaluation criteria.

The remedial option with the highest total rating is considered the best-suited remedy.

Using the criteria definitions as standards, the rating values were based on the degree to which the alternatives satisfy the evaluation criteria. Ratings for the three (3) criteria (effectiveness, implementability, and cost) are as follows:

Criterion 1: Effectiveness

This criterion was rated based on each remedial option's compliance with:

- overall protection to human health and the environment;
- short-term effectiveness;
- reduction in toxicity, mobility, and volume of contaminants by treatment
- long-term effectiveness; and
- compliance with regulatory issues and requirements.

Remedial Options 1 and 2 would satisfy all the criteria above by providing short and long-term overall protection to human health and environment, reduce the toxicity, mobility, and volume of contaminants through treatment, and comply with regulatory issues and requirements through the excavation and remediation of dioxin-contaminated soils.

Remedial Option 3 would minimize direct contact with the dioxin-contaminated soils through placement of a soil cover, reducing receptor exposure. Remedial Option 3 would provide overall short term effective protection to human health and the environment and comply with regulatory issues and requirements. The toxicity, mobility, and volume of contaminated soil would not be effectively mitigated under this option. The long term effectiveness of a soil cover would require periodic maintenance. The soil cover may not be effective in the long term as potential disturbance of the soil cover by future activities at the Site may expose the underlying soils. Use and construction restrictions would be required to minimize potential disturbance to the soil cover.

Remedial Options 1 and 2 are rated a "3" because these options effectively achieve compliance with all the elements of this criterion. Remedial Option 3 is rated a "2", as it fulfills more than half of the elements of criterion, however, fails to reduce the toxicity, mobility and volume of the contaminants, and the possibility of future activities of the site may expose underlying soils.

Criterion 2: Implementability

This criterion was rated based on each remedial option's compliance with:

- technical feasibility of implementing a remedial option (i.e., technology reliability, operational difficulties, logistics, climate and terrain limitations);
- administrative feasibility of implementing a remedial option (i.e., coordination of activities, permits, easements, right-of-way agreements, and zoning variances); and,
- availability of materials and services required during implementation.

Remedial Options 1 and 2 would satisfy all the elements of the criterion. Technical feasibility for incineration is technologically reliable for the remediation of dioxin-contaminated soil. Administrative feasibility is satisfied, as it is not anticipated the necessary permits will not be obtainable. The equipment and materials are readily available.

Remedial Option 3 would satisfy more than half of the elements of the criterion. Technical feasibility for soil cover is technologically reliable provided long term periodic maintenance is performed, and restrictions for land use for the soil cover are implemented. The material and equipment for the soil cover are readily available. Administrative feasibility may be an issue for Remedial Option 3 as land use restriction for this area would most likely be required to maintain the integrity and effectiveness of the soil cover.

Remedial Options 1 and 2 are rated a "3" because these options effectively achieve compliance with all the elements of this criterion. Remedial Option 3 is rated a "2", as it fulfills more than half of the elements of criterion, however, does not satisfy the administrative feasibility element because a land use restriction would most likely be implemented. Since the future land scenario is expected to be residential, the soil cover area would be prohibited for residential use.

Criterion 3: Cost

This criterion was rated based on the relative magnitude to implement a remedial option to address the lead impacted soils at the former firing ranges. A higher rating is assigned to the more cost-effective remedial option. A rating of "3" is awarded for a present worth cost of less than $1,000,000, a rating of "2" for a present worth cost between $1,000,000 and $5,000,000 and a rating of "1" for a present worth greater than $5,000,000.

Remedial Option 1 is rated a "1" as present worth costs associated with this remedial option is estimated to exceed $5,000,000. Remedial Options 2 is rated "2" as present worth costs associated with this remedial option is estimated between $1,000,000 and $5,000,000. Remedial Options 3 is rated a "3" as present worth costs associated with this remedial option are estimated below $1,000,000.

Table F-1

Comparative Analysis of Remedial Options

OSC Pesticide Mixing and Loading Area, East Kapolei, Hawaii

Remedial Option	Effectiveness	Implementability	Cost	Total Rating
1:Excavation, transport and thermal incineration at an off-island approved facility	3	3	1	7
2: Excavation and thermal incineration on-site	3	3	2	8
3: Soil Cover	2	2	3	7

Notes:

a) Remedial Options are rated numerically, according to the following system:

1 - Satisfies/fulfills less than half of the elements of the evaluation criteria

2 - Satisfies/fulfills more than half of the elements of the evaluation criteria

3 - Satisfies/fulfills all elements of the evaluation criteria